Cutting Costs in Steam Raising, In Distillation and Filtering

By Paul Truesdell
N.P.N. STAFF WRITER

Article 1

Efficient and inefficient combustion. At right is the stack of the Seneca's old boiler house; at left the stack of the new one. The boilers that are making all the smoke are running at 50 per cent of rating. The non-smoking boilers are running at 150 per cent of rating

WARREN, Pa., April 28

GEORGE P. Brockway, president and general manager of the Seneca Oil Works at Warren and one of the veteran Pennsylvania refiners, has recently installed at his refinery three major improvements which he says, for a relatively small investment, greatly increase the plant's efficiency and its chances of making a satisfactory profit.

The three improvements are:

A new boiler plant.

A new type shell still.

A new filter house with clay conveying machinery and a clay roasting furnace.

The boiler plant will be described in this article. Article 2 will discuss the new style still and Article 3 the filter house.

One of the prominent features in the new Seneca boiler house is a rude but well-padded bench. On this bench the firemen spend much of their time. Shovels don't wear out as quickly in the Seneca boiler house as they used to a few months ago because the firemen aren't heaving nearly so much coal on the fire as they used to. In fact, they don't heave any directly into the furnaces.

The new boiler house, which is a standard Truscon steel building with structural steel frame, copper-bearing sheet steel sides and transite roof houses two Union City horizontal return tubular boilers.

These boilers are rated at 200 horsepower each and are stoker fired. that is why the firemen have so much time to sit down. And when they are sitting down they are not running up Mr. Brockway's coal bill by throwing unneeded fuel on the fires.

The boilers are mounted on 8-foot settings, which allows plenty of space for complete combustion. They are suspended by heavy bolts from I-beams supported by structural steel columns so they are supported entirely independently of the brickwork of the settings, with the consequent avoidance of buckling that often occurs where boilers rest on the brick walls.

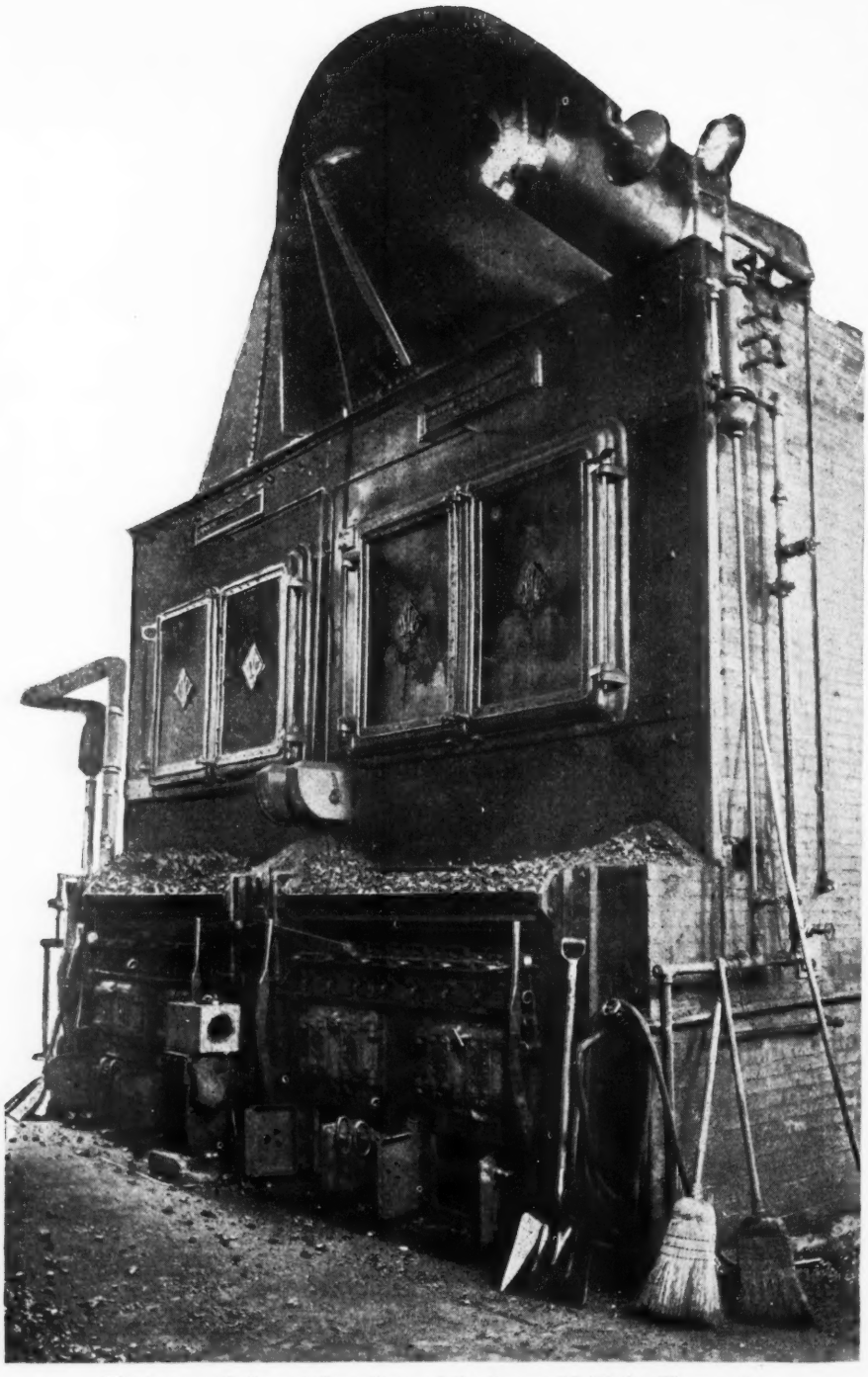
Slack coal is the fuel used and the boilers are operating at 70 to 72 per cent efficiency, according to Herbert A. Ross, consulting engineer who was responsible for their installation. The boiler pressure is 80 pounds and the flue gases show a carbon dioxide content of 12½ to 14 per cent, according to Mr. Ross. Their operation is almost entirely smokeless, as will be remarked upon later.

The stokers installed are the Cokal Pulverzone type. Above the fire doors of each furnace is a coal hopper. These are kept filled with coal by hand at the Seneca plant, although they could be fed automatically by gravity in a plant where an elevated coal bin was installed.

At the bottom of the hopper are four pairs, or eight in all, of reciprocating feeders, actuated by an eccentric motor drive. A quarter horsepower motor furnishes the power for each stoker. These feeders alternately push the coal into the fire at a predetermined rate.

Just below the feeders on each boiler five small steam jets in a horizontal row, project into the furnace. The steam blast catches the very fine coal as it is pushed into the firebox and throws it out into the firebox where it burns in suspension in the clouds of flaming gas which is generated from the coal as it passes into the heating zone, giving somewhat the effect of a powdered coal fired furnace.

The feed water goes to the boilers at 220 degrees Fahr. from a Cochrane open type feed water heater the



The two new boilers at the refinery of the Seneca Oil Works, Warren, Pa.

heat for which comes from exhaust steam. A system is in effect at this plant by which considerable of the water used as steam in the distillation process is recovered from the stills and condensed for boiler feed.

Mr. Ross estimates that about 30 per cent of the total feed water used in the new boilers comes from this source and is, of course, pure distilled water. The remainder of the feed water is drawn from the condenser boxes where it has picked up considerable heat. He states that the high pressure of distilled water used to feed the boilers undoubtedly has an important effect in reducing the tendency of the boiler tubes to collect scale.

The new units have been in operation since last September and while they have been shut down several times for inspection, it has not yet been found necessary to remove scale from the tubes. Work is being done on means to recover economically still more of the steam from the stills for boiler feed.

The boilers are equipped with modern indicating and control devices. Bailey duplex draft gages, Brown indicating and recording flow meters; Cochrane feed water meters.

When it came to providing means for bringing the coal into the new boiler house it was simply a matter of extending the system devised by Mr. Brockway 20 years ago. How to get the coal to the stills and boilers in the plant was a matter of puzzlement to him at that time. Finally he hit upon the idea of simply elevating the railroad tracks and running them through the plant alongside the firing fronts of the still batteries and the boilers.

So today the tracks run close to the furnaces, raised on concrete piers about 6 feet off the ground so there is room to dump the coal and haul the empties away, leaving the coal where wanted. The elevated track was simply extended into the new boiler house which was built on a line with and adjoining the old one. In the two boiler houses there is trackage for four cars of coal.

Before the new plant was built, steam for the refinery was furnished by a battery of five horizontal return tubular boilers. These were hand fired, were on low settings and operated at relatively low efficiency. They were rated altogether at 700 horsepower. Their grates and stack were such that it was necessary to burn run of mine coal which costs 75 cents more a ton, generally, than slack. Now three of these boilers are shut down all of the time and four of them most of the time.

The one or two that are kept in operation are held with banked fires to meet peak load conditions. The new boiler house was built with room for a third one just like the two that are now installed. Mr. Brockway plans some day to put in that third boiler and when he does it is likely that the old ones will go out of service forever.

A picture is shown herewith of two smoke stacks. They are the stacks of the old and the new boiler houses at the Seneca plant. The brick chimney is that of the old plant, the steel stack that of the new. It will be noted that thick clouds of inky smoke are pouring out of the former while the steel stack shows no smoke whatever.

At the time when this picture was taken, two of the old boilers were running and of course, both of the new ones. The old boilers were developing together about 175 horsepower or about 50 per cent of their rating while the new ones were developing 575 horsepower or 150 per cent of their rating.

The new boilers, according to Mr. Ross, when the picture was taken were consuming 30 pounds of coal per square foot of grate area and evaporating about 10 pounds of water per pound of coal burned from and at 212 degrees Fahr., while the old boilers were evaporating about 7½ pounds of water per pound of coal from and at 212 degrees Fahr.

"I have every reason to think we made no mistake," says Mr. Brockway.

Kansas Jobbers Consider Legislation To Knock Out the Q. D. A.

By Allen S. James
N. P. N. STAFF WRITER

WICHITA, April 28

AN EFFORT will be made by the Kansas Oil Men's Association within the next few months to obtain legislation directed at the abolishment of the "Quantity Discount Agreement" in Kansas and possibly throughout entire Standard of Indiana territory, where the "Q. D. A." is practiced.

This action was approved by members while attending the 14th annual convention here April 26 and 27. The vote fell one short of being unanimous.

The second most important action was adoption of a resolution approving the present 2 cent gasoline tax in Kansas, but opposing any further increase. The resolution also expressed opposition to the repeal of that part of the present law which provides a refund on gasoline sold for agricultural purposes or other purposes than use on the roads as motor fuel. Only six votes were cast against this resolution.

Election of officers and acceptance of the various committee reports completed the business session.

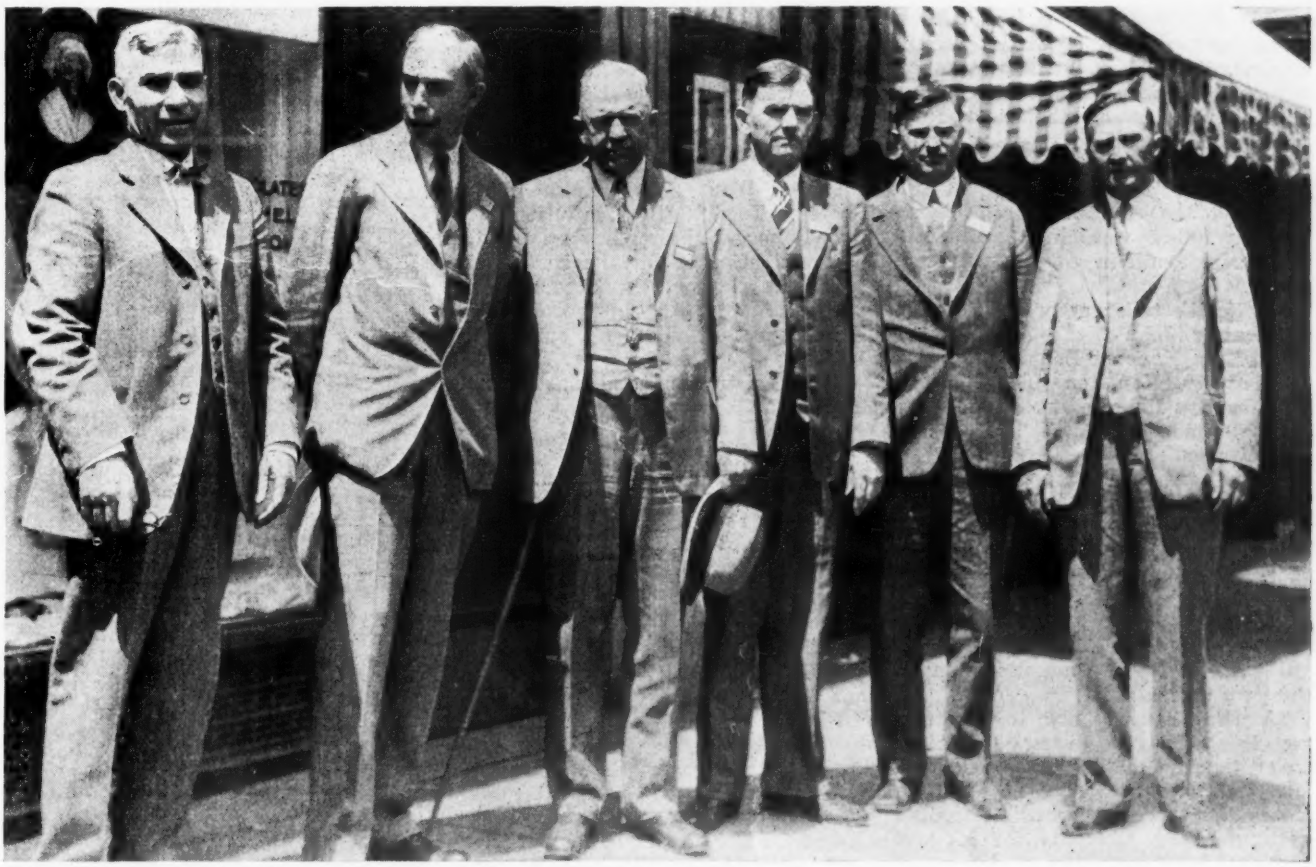
A. C. Carpenter, Lesh Oil Co., Ottawa, was re-elected president for the third consecutive time, despite his request to the contrary.

Other officers chosen are: J. S. Longshore, Sunflower Oil Co., Topeka, re-elected first vice president; R. H. Garvey, Service Oil Co., Colby, second vice president; C. D. Williams, Williams Oil Co., Anthony, third vice president; R. M. Marks, Baxter Springs, fourth vice president; A. W. Long, Manhattan Oil Co., Manhattan, re-elected treasurer; J. A. Motter, Wichita, re-elected secretary; J. T. Nuttle, K-T Oil Corp., Wichita, E. S. Rule, Golden Rule Refg. Co., Wichita, and W. L. Rosier, Rosier Oil Co., Hutchinson, executive committee.

The association increased the number of vice presidents to four at the suggestion of the secretary, to facilitate holding group meeting in various sections of the state.

A legislative committee to be appointed by the president within the next 15 days will handle the work pertaining to the "Q. D. A." From the discussion which preceded the adoption of the resolution calling for such a committee, the impression was gathered that the committee will investigate, first, the possibility of obtaining state legislation which would knock out the "Q. D. A." in Kansas. Failing in that attempt it was understood the committee will investigate the possibility of placing the matter before the federal government.

Most of the discussion about the "Q. D. A." indicated the jobbers be-



Guidance of Kansas Oil Men's Association affairs for the ensuing year has been entrusted to these men. From left to right: A. W. Long, Manhattan, treasurer; A. C. Carpenter, Ottawa, elected president for the third consecutive time; J. S. Longshore, Topeka, first vice president; C. D. Williams, Anthony, third vice president; R. H. Garvey, Colby, second vice president, and J. A. Motter, Wichita, secretary. R. M. Marks, Baxter Springs, elected fourth vice president is not in the picture

lieved the practice could be legislated out of existence on the grounds of being unfair competition. One or two jobbers asserted, when they inquired of customers the reason for the loss of their business, the customers showed them letters from their company headquarters in other states instructing them to buy all their gasolines at Standard Oil Co. stations, to secure the Q. D. A. concessions.

To meet this competition, several jobbers said, it was necessary for them to meet the "Q. D. A." and thereby cut down the margin of profit. This cut in the margin of profit was declared disastrous for the small Independent jobber whose profit in any case was comparatively small.

Charles F. Scott, of Iola, chairman of the Kansas State Highway Commission and a candidate for governor, was called to pinch-talk on Kansas highways for John W. Gardner, a director of the Highway Commission, who failed to arrive in time to deliver his scheduled address.

Mr. Scott was asked to outline the results of a survey recently conducted by a special committee appointed by Governor Paulen to recommend changes in the present highway law. The committee has been taking testimony in various sections of the state.

Explaining that, since he was a gubernatorial candidate, he had deemed it inadvisable to attend the hearings, Mr. Scott said he had gathered, in his talks with members of the committee, the impression that, if an increase in the tax is recommended, it will not be more than 1 cent, making the total three cents. A redistribution of the funds also was urged in much of the testimony, Mr. Scott said, which also showed a sentiment favoring a small increase in the tax, provided the additional funds were used on local roads, and to fill in gaps in the state roads.

Mr. Scott's talk was preceded by an address by John McE. Ames, president of the Kanotex Refining Co., Arkansas City, Kan., on "The Relation Between the Independent Refiner and the Independent Jobber." Mr. Ames said that only by working in closest harmony could the Independent jobber and the Independent refiner hope to survive. The Independent refiner having no retail distribution of his own offers no competition to the Independent jobber, Mr. Ames pointed out. The jobber who buys gasoline from a refiner having his own retail stations helps that refiner compete with him.

"A jobber may be able to buy from such a refiner at a price slightly under that quoted by other refiners," Mr. Ames declared, "but he is losing money in the long run. A refiner getting 10 or 12 cents for a good portion of his gasoline at his retail stations can afford to 'dump' his surplus off on a jobber at a price below the market. But the jobber who buys the goods is merely giving that refiner more excuse for keeping his production at a high level with the resulting bad effect on the entire market structure."

E. P. Hayes, president of the Hayes Equipment Mfg. Co., Wichita, recently completed a trip around the world, and he told oil men how gasoline and oils are handled in other countries.

The Thursday afternoon session included talks by C. O. Hoover, Deepwater Refining, Inc., Houston, on "Refining of Lubricating Oils," and by Mr. Carpenter on "The New S. A. E. Viscosity Numbers."

Association members and friends enjoyed a banquet and dance Thursday evening. The business sessions were virtually concluded Friday morning. At the afternoon session Frank Packard, tax attorney for the Standard Oil Co. of Indiana discussed "Do Oil Men Want An Increase In The Gasoline Tax?" The resolution mentioned above had already been adopted, however, prior to Mr. Packard's talk.

Lou Harrington, executive manager of the I. O. M. A., Chicago, discussed the independent oil man's outlook for 1928.

The registration total was close to 250.

Coming Meetings

Natural Gas Department of American Gas Association, Texas Fair Grounds, Dallas, May 7, 8, 9, 10.

Wisconsin Independent Oil Jobbers Association, Plankinton Hotel, Milwaukee, Wis., May 9.

National Oil Scouts of America, Amarillo, Tex., May 21, 22.

Natural Gasoline Association of America, Hotel Mayo, Tulsa, May 22, 23, 24.

Automobile Associated Trades of Illinois, Hotel Morrison, Chicago, May 24, 25.

West Virginia Oil Marketers Association, Kanawha Hotel, Charleston, W. Va., June 14, 15.

Flooding Will Be Topic At Bradford Meeting

BRADFORD, Pa., April 30.—The second regular meeting of the eastern division of development and production engineering of the American Petroleum Institute will be held in the K. of C. Hall, Bradford, May 17 and 18.

Field trips to points of interest to illustrate drilling methods, development and recovery in the Bradford field will occupy May 18, after presentation of papers on these subjects May 17, according to Frank M. Brewster, Petroleum Reclamation Co., Bradford, chairman of the eastern division.

On the program May 17 will be: Forest D. Dorn, Forest Oil Co., who will speak on "Water Flooding in the Bradford Field"; J. French Robinson, Peoples Gas Co., and J. G. Montgomery, Jr., United Natural Gas Co., both of whom will speak on "Deep Well Drilling—Cable Tool Method"; R. T. Zook, Sloan and Zook Co., "Coring with Cable Tools"; R. M. Haskell, Associated Producers Co., "Air Pressure Recovery in Eastern Fields"; A. E. Booth, Bradford, "Small Field Economies"; and Paul D. Torrey, of the Northwestern Pennsylvania Producers Association, "Some Geological Factors Influencing the Recovery of Oil by Flooding."

"The Story of Petroleum" filmed by the U. S. Bureau of Mines and the American Petroleum Institute, will be exhibited after dinner May 17.

Plan Changes in Wisconsin State Organization

MILWAUKEE, April 26.—Because the word "Independent" lacks a satisfactory definition the Wisconsin Independent Oil Jobbers Association may throw it out of their name. The question will be voted May 9 when that organization holds its annual convention and election of officers in Milwaukee.

Time was when any oil company except the Standard was looked upon as Independent. Later "Independent" came popularly to mean any oil company except an integrated one having departments in all three of the major branches of the industry. Now there are a number of conflicting definitions. As a result the Wisconsin oil men may call their organization the Wisconsin Petroleum Association.

Furthermore the Wisconsin oil men are expected to withdraw their recognition of any particular joint marketing program as part of their association activities. Within the state organization are jobbers who market according to the plan of the Independent Oil Men of America, under the Spread Red Eagle emblem. Others have recently espoused the marketing program of Dixie Gas—the Power to Pass.

A committee of Wisconsin jobbers who met in Milwaukee recently to lay out a program for the May 9 meeting agreed to propose a policy of confining the state association's activities to matters of absolute mutual interest. Problems of ethics, state legislation, taxation, freight rates and other things which interest every oil man alike, probably will employ the entire attention of the state association in the future.

Gusher Reported in Persia

NEW YORK, April 27.—A wireless dispatch to the New York Times says an 11,000-barrel well has been brought in at Naft Khanah, 80 miles northeast of Bagdad and just across the Iraq border in Persia.

Prorating Machinery Put in Order In Three West Texas Districts

By Paul Wagner
N P N STAFF WRITER

FORT WORTH, April 28

PRORATING of crude oil production in three west Texas areas engaged the attention of southwestern operators this week, with the result that—

(1)—Machinery was set in motion to limit Winkler county production to 150,000 barrels daily after May 5, effective date of a railroad commission order issued under the Texas statutes to prevent waste of oil and gas.

(2)—Members of the Pecos County prorating committee, which apportions Yates field market outlet under voluntary arrangements, authorized study of a proposal to form a new yardstick by combining the proved acreage and potential production plans of determining what percentages operators may produce.

The May outlet was continued at 51,500 barrels daily, under the present proved acreage yardstick, which compares with estimated potential production of 1,500,000 barrels daily.

(3)—Operators in the Settles-Roberts deep lime area of Howard and Glasscock counties, answering a call of the railroad commission, authorized a committee of five to study conditions for 90 days and make recommendations to be used should an emergency arise. It was estimated that there now exists shut in potential production of 22,000 barrels daily in the Settles-Roberts area, for which there are no present pipeline outlets.

The committee of seven operators named to handle Winkler county prorating measures[1] met in Fort Worth, April 25, one day after formal issuance of the railroad commission order, and selected Harold N. Pardee of Cisco, Texas, as umpire. He will administer the commission rules, subject to review of the advisory committee, which may revoke any ruling or order issued in the field, subject to appeal to and approval of the railroad commission.

Mr. Pardee, who came to Texas from California in 1913, has been identified with southwestern field operations about 15 years. He was first with The Texas Co. He was Ranger district superintendent for Humble Oil & Refining Co., from 1919-1925, when he became general manager of the Landreth Production Co.'s field operations. He supervised drilling of 53 wells for the Landreth interests on the Waggoner ranch, Wilbarger county division of the Greater Wichita Falls district, then went in business for himself after Landreth's Waggoner ranch property was sold to the Phillips Petroleum Co.

The advisory committee took occasion, at the meeting when Mr. Pardee was selected umpire, to recommend a change in the commission order issued the day previously.

It was recommended that rule 2 of the order, which provides for nominations of pipeline runs in advance of semi-monthly readjustment periods, should be eliminated. The committee felt the rule is unnecessary and that its enforcement might bring about embarrassment to operators.

Many Winkler field operators built short pipeline transportation facilities with the idea of handling only their own oil and it was the expressed feeling of committee members that enforcement of rule 2 would result in nominations of a total outlet below the 150,000-barrel mark set as the field maximum.

There are no common purchasers of crude in the Winkler field. The 70-mile "shuttle" line of Atlantic Pipeline Co., from the field to a Midland connection with Magnolia Petroleum Co.'s west Texas trunk system, is kept full of oil under a transportation contract of the Atlantic, Magnolia and Pure companies.

With the exception of Humble Pipeline Co.'s feeder to McCamey, all other transportation systems from Winkler field serve tank car loading racks on the Texas & Pacific and Kansas City, Mexico & Orient railroads.[2] The Shell Pipeline Corp.'s "feeder" to McCamey eventually will tie in on its Mid-Continent trunk system, to be completed about July or August. For the present, however, it is used in handling crude that finds its way to market over the KCM&O.

As Winkler field operators have handled as high as 240,000 barrels daily by transporting and storing crude, the committee felt that they could take care of 150,000 barrels daily without embarrassing themselves, if allowed to use their own discretion about transporting or storing.

Abrogation of rule 2 would help also to meet the problem of Cranfill & Reynolds for delivery of 3,000,000 barrels of crude to Magnolia Petroleum Co., on a storage contract calling for about 16,500 barrels daily.

Combination of the proved acreage and potential production methods of getting a yardstick for Winkler prorating[3] had been regarded as largely eliminating the problem surrounding the Magnolia-Cranfill & Reynolds contract. It allows large wells on small leaseholds a fairer fraction of allowable production in the field than would be possible otherwise.

Recognition of the merits of the combined yardstick method caused the Pecos county committee, April 26, to start the study of a similar plan for the Yates field. It originally used the potential production plan, but changed to a proved acreage basis when the committee found that the first method stimulated drilling to build up potentials and gain higher fractions of market outlet.

The proved acreage plan, which has been more satisfactory, was then tried. It is still in effect. Operators believe, however, that a combination of the two, similar but not identical with the Winkler plan, will provide a fairer yardstick because of bringing about nearer equality of production in relation to well capacities.

IT IS proposed to ask the railroad commission to issue an order in Yates field, replacing the present voluntary arrangement, after the situation has been studied more thoroughly and a plan adjusted to field peculiarities.

Company	Pct. April	Pct. May	Bbls. May
Mid-Kansas & Transcontinental	35.05	33.60	17,304
California	15.09	14.47	7,452
Gulf	12.68	12.16	6,262
Roxana	9.18	8.80	4,432
Humble	7.12	6.82	3,512
McMan-Marland	8.00	7.67	3,950
Marland	2.00	1.92	989
McMan	1.00	6.00	3,090
Simms	6.00	6.00	2,090
Red Bank	1.00	1.00	515
Savoy-Mazda	.60	.60	309
Kirby-Edison	.60	.34	175
Pandem-Gibson	.76	....	....
Phillips	.29	.19	100
Skelly	.50	.30	153
Kirby	.13	.13	67
Totals	100.00	100.00	51,500

(Market figured on following basis of outlets: Humble, 30,000 bbls.; Il-

1—NATIONAL PETROLEUM NEWS, April 25, 1928, pages 24-25.

2—NATIONAL PETROLEUM NEWS, April 11, 1928, page 22.

3—NATIONAL PETROLEUM NEWS, April 25, 1928, page 24.

linois Pipeline, 12,000 bbls.; Gulf, 5000 bbls.; Roxana, 4500 bbls.)

The railroad commission was advised at the Howard-Glasscock county conference in Fort Worth, April 28, that there are no present plans of operators to open the Settles-Roberts deep lime wells, which have been consistentely shut in when completed.

The 140-odd shallow wells in the Chalk area of southeastern Howard county were eliminated from discussion. Approximately 4000 barrels daily of Chalk district settled production finds market outlet to the Col-Tex Refining Co., at Colorado City, and the Magnolia Petroleum Co.

There are no outlets for deep lime oil of the area, although W. M. Priddy, of Wichita Falls told the conference he is promoting a pipeline and refinery on the Texas & Pacific railroad with the idea of purchasing 5000 to 15,000 barrels of oil daily.

Robert T. Piner, banker of Big Spring, and representative of Mrs. Dora Roberts, principal royalty owner in the deep pay territory, was made chairman of a committee of five appointed to study conditions for 90 days and make such recommendations to the railroad commission as an emergency might occasion.

Other members of the committee are George C. Matson of the Schermerhorn Oil Co., Tulsa; William Fleming, F.H.E. Oil Co., Sherman, Texas; I. G. Harmon, Marland Production Co., Ponca City; and Frank T. Pickrell, Texon-Group 1 interests, Big Lake, Texas.

In the discussion that preceded naming of the Howard-Glasscock county committee, Chief Supervisor R. B. Parker, of the oil and gas division, stated the railroad commission's future policy of acting promptly and aggressively when any Texas field appears to threaten, as in the Winkler area.

Representatives of various companies then declared they saw no need for an order at present in the Settles-Roberts area; as all deep wells are shut in and promise to continue so. A. S. Hardwicke of the Magnolia's legal department was the principal contender against necessity for an order to handle the situation. He denied the Magnolia's being party to any shut in agreement in the field, saying his company closed down wells and expected to keep them so because of industrial conditions.

Others made similar statements. All, however, discounted the idea of the area having any immediate threat, citing the lack of pipeline outlet for the deep oil.

Correction

Information received after refinery table on page 122 of this issue was published, indicates that price of Oklahoma Grades B and BB natural gasoline should have been 5.25 to 5.50 cents in April 30 column, instead of 5.50 cents flat.

Calumet Customers Check Up On Service Stations

EL PASO, Texas, April 27.—In an effort to get the motorist's opinion as to what he thinks of the company's service stations, R. N. Mullin, president of the Calumet Oil Co. here, conceived the idea of using such a form as the one reproduced herewith.

The forms are given out to customers by a salesman or officer of the company. The customer is told that his opinion is being sought in an effort to improve the stations and service, and he is asked to check the column which will properly give his impression of the particular station or stations at which he may stop. He then mails the form back to the company, or hands it to a salesman or officer.

The form lists the principal requirements expected by the company from its service station men. The men are told frankly that the public is being asked to grade them and each one knows that his station is on inspection at all times.

This plan, the company says, results in the men being on their toes, besides bringing many valuable comments and suggestions from the public to the company.

The company operates 25 bulk and service stations in west Texas, New Mexico and Arizona.

The customer's opinion of a service station is secured through these forms by the Calumet Oil Co., El Paso, Texas. Executives or salesmen give them to friends or customers, who are asked to check the various points. This is being done to improve service and the appearance of stations.

Analysis of Station

SERVICE OFFERED			
Tires checked	Yes		No
Radiator checked	Yes		No
Battery checked	Yes		No
Windshield wiped	Yes		No
Headlights wiped	Yes		No
SALESMAN			
Wearing white coveralls	Yes		No
Personal appearance	Neat	Fair	Poor
Pleasant, courteous, and respectful	Very	Fair	Not
Rapidity or service	Fast	Fair	Slow
Salesmanship (including effort to sell oil, grease job, etc.)	Good	Fair	None
APPEARANCE OF STATION			
Driveways	Clean	Fair	Dirty
Grounds	Neat	Fair	Dirty
Premises free from unnecessary objects	Yes		No
Buildings and windows	Clean	Fair	Dirty
Gasoline and oil pumps	Clean	Fair	Dirty

Average Crude Production Higher in March

(By Telegraph)

WASHINGTON, May 1.—Crude production in the United States increased 6,513,000 barrels during March, to 74,465,000 barrels, according to U. S. Bureau of Mines. This is a daily average of 2,402,000 barrels in March, compared with daily average of 2,332,800 barrels in February.

Stocks of all oils, except gas and fuels, increased in March. Crude stocks east of California gained 5,137,000 barrels, standing at 368,099,000 barrels on March 31. Crude stocks in California March 31 were 114,117,000 barrels, a decline of 790,000 barrels from Feb. 29 stocks. Total crude stocks March 31 were 482,216,000 barrels, an increase of 4,346,000 barrels in March.

Gasoline production increased 2,470,000 barrels to 29,245,000 barrels, a daily average of 943,000 barrels, which is an increase of 19,725 barrels daily over February average output. Stocks increased 1,447,000 barrels to 40,229,000 barrels March 31.

Kerosene production decreased 66,000 barrels to 4,717,000 barrels and stocks gained 134,000 barrels to 7,826,000 barrels.

Gas and fuel oil production was 34,071,000 barrels, a gain of 3,000,000 barrels, and stocks were 123,654,000 barrels, a decrease of 144,000 barrels.

Lubricant output was 2,905,000 barrels, a gain of 177,000 barrels over February, and stocks rose 80,000 barrels to 8,412,000 barrels on March 31.

W. P. R. A. Moving Offices

TULSA, April 30.—Headquarters of the Western Petroleum Refiners Association are being moved to 607 Cosden building, Tulsa, it was announced today by Howard Bennette, managing director. Offices have been on the fifth floor of the same building and are being moved to a more compact group on the floor above.

Viscosity Numbers Coming Into Use; Profits in Car Lubrication

Staff Special

CLEVELAND, April 28

TWENTY-FOUR automobile manufacturers are including or will soon include Society of Automotive Engineers viscosity numbers for motor oils in their instruction book recommendations for car owners.

Twenty-five large oil companies are preparing to put the S.A.E. viscosity numbers on their motor oils as well as their brand names.

Members of Ohio petroleum clubs were told of this swing to S.A.E. numbers at their April meetings by George E. Read, manager of the Cleveland and eastern division of the Calumet Refining Co., Chicago. Mr. Read's topic was "Lubrication and Profits."

The high compression engines are bringing new motor lubrication problems, Mr. Read told the Ohio marketers. Because of the smaller volume of the firing chambers of engines, oil companies will have to put out cleaner oils, because any appreciable deposit of carbon will interfere with the efficiency of operation of the engine. Oils to meet the new conditions of operation must be more uniform, he said.

Mr. Read, who recently conferred with automotive engineers in Detroit, said automobile manufacturers opposed recommending any one trademarked or brand of oil, but they are specifying what oils will care for their engines at the higher speeds at which they are being driven.

The S.A.E. numbers* as adopted by the lubricants division of the standards committee of the Society of Automotive Engineers are:

S. A. E. Recommended Practice

Viscosity Number	Viscsity Range† Saybolt Universal Seconds At 130 degrees Fahr.	At 210 degrees Fahr.
10	90-115	.....
20	120-150	.....
30	185-220	.....
40	255	70
50	.....	75-95
60	.....	105-120

†Oils with viscosities falling between the ranges specified shall be classified in the next lower grades.

Mr. Read explained that the viscosities at 130 degrees F. gave a truer gauge of the value of the oil under engine operating conditions.

Turning to a discussion of lubrication and profits, Mr. Read said the oil industry was only about 75 per cent efficient in merchandising motor oils and car lubrication, because it has failed to get over to the public the idea of more miles of transportation to be derived from good lubrication. It has been spending more time in selling miles of lubrication than in selling efficient lubrication. By miles of transportation he meant the life of a car would be prolonged if it were well lubricated at more frequent intervals.

Several lubricating oil manufacturers who in recent years have been recommending crankcase changes only at intervals of more than 1000 miles, if their oil was used, have trimmed their recommendation to 1000 miles and may even fall back to 750 miles, Mr. Read said.

In selling miles per gallon of oil, Mr. Read said many persons in the industry had overlooked the fact that other parts of the car needed lubrication.

"Motor cars should be thoroughly lubricated every 500 miles," he asserted. "It is impossible to get the public to come in for a general lubrication job unless you hook it up with an oil change. You will not be getting the car owner to buy something he doesn't need when you sell him a complete lubrication every 500 miles, but you will be getting him to buy something that will mean money in his pocket."

As an example Mr. Read cited the case of I. G. Monroe, field representative of the Ohio Petroleum Marketers Association who has driven an $1100 car more than 40,000 miles at a total expense of $43.20 for repairs. Mr. Monroe has lubricated his car religiously every 500 miles.

"I suspect many oil companies are not thoroughly sold on lubrication themselves," Mr. Read continued. "One large company in checking the repair reports on cars of more than 300 salesmen found that over half of the repairs were made necessary by lack of lubrication or faulty lubrication.

"I know a lubricating oil salesman who bought a service station in 1925 that was doing only 50,000 gallons gasoline business a year. He specialized on car lubrication. When I saw him a month ago he was increasing his pits from two to five and said he had sold 200,000 gallons of gasoline last year.

"A western refining company with retail stations, in checking the methods of a district manager whose district led all others in business gain, found this manager impressed this slogan on his men: 'Push the sale of lubricating oils and gasoline gallonage will follow.' Get a customer to use your lubricating oils and he will use your gasoline.

"Get the public to lubricate its cars regularly and your profits per station will grow. But how can the public get the lubrication idea?

"One company is making its station men real merchants. It takes an automobile instruction book a week and goes over it with its men to educate them in that particular car. The men learn the car and they gain the confidence of the owners of that make of car.

"You men might try collective advertising in your community. The companies of one city are considering a lubrication week.

"The oil companies must put over the lubrication idea or they may lose the lubrication business. Automobile manufacturers are anxious that their customers shall get satisfactory service from their cars. To get this service, the cars must be properly lubricated. If the oil companies won't properly lubricate the cars, the automobile dealers will.

"Why should the automobile industry take that profit from the oil companies? The only reason is that many of us are not training our men to give good lubrication."

*See Feb. 8, 1928, N. P. N. for discussion by E. W. Upham, chairman of lubricants division.

S.A.E. Viscosity Numbers Used by Compounder

CHICAGO, April 28.—The Fred G. Clark Co. of Illinois, headed by B. E. Beyer of Chicago, circularized the jobbing trade in this territory recently with an announcement that it will label its four leading brands of motor oil with the S.A.E. viscosity numbers.

The company compounds oils for jobbers to be sold under the private brands to their customers, putting it up in packages bearing the customer's name and brand and shipping it in cases where required. Now if a jobber customer wishes to know the S. A. E. viscosity number of the oil he has been selling he can learn by consulting the stock list of the compounder. The Clark company will print the S. A. E. viscosity number on the package if desired.

The bulletin says that 20 of the largest automobile manufacturers already have signified their intention to use S. A. E. viscosity numbers in their instruction booklets and several already have issued such booklets. Mr. Beyer says it is the company's opinion that this is the proper way to designate lubricating oils and believes these numbers will be used universally in a short time.

The Texas Corp. Subsidiaries Increase Activities in All Divisions

Staff Special

CLEVELAND, April 28

OPERATING subsidiaries of The Texas Corp. increased their activities in all divisions of the industry in 1927 over 1926. Profits were not so large but that result was common to the industry because of the crude oil overproduction.

Expenditures for plant improvement and expansion amounted to $37,257,212 last year. They were divided as follows:

Producing division	$15,908,199
Pipe Lines	2,335,413
Refining division	9,000,152
Domestic sales	6,955,887
Export dept. and subsidiaries	1,688,595
All other	1,388,966
Total	$37,257,212

The Texas Corp. subsidiaries produced 26,074,864 barrels of crude last year in the United States. This was a gain of 5,065,665 barrels over its 1926 production. The average price received from crude was 57.97 cents a barrel less than in 1926. More crude was bought and the pipe lines transported a great deal more than in 1926.

Refining was stepped up 6.15 per cent and gasoline production increased 13.72 per cent. Gasoline yield from crude was increased 2.35 per cent, although heavier crude oil was run, 30 per cent of the raw material containing little straight run gasoline, the company reported to stockholders in the *Texaco Star*, its house organ. Average recovery of gasoline was 46.73 per cent. Plant expenses were lower.

The company had a total refining capacity of 144,050 barrels a day Dec. 31. The plants' location and rated daily capacity are:

Port Arthur, Texas	60,000
Port Neches, Texas	20,000
West Dallas, Texas	15,000
West Tulsa, Okla.	10,000
Lockport, Ill.	6,000
Casper, Wyo.	6,000
Craig, Colo.	750
Pryse, Ky.	3,000
Total	120,750
TOPPING PLANTS	
Shreveport, La.	5,800
Tampico, Mexico	10,000
Total topping	15,800
ASPHALT PLANTS	
Norfolk, Va.	2,500
Marcus Hook, Pa.	2,500
Providence, R. I.	2,500
Total asphalt	7,500
GRAND TOTAL	144,050

Coastwise and export movement of oils was larger last year than in 1926, but shipments of oil from Mexico and for other companies were smaller, making the total marine movement slightly less than in 1926. Marine department expenses were lowered 9.08 per cent. One tanker was laid up because of lack of cargo, the first time this action was necessary in two years. Additions to the world's tanker fleet made competition keen in the latter part of 1927 and charter rates fell to unprofitably low levels, R. C. Holmes, president, reported.

Its marine equipment Dec. 31 consisted of 18 steam vessels of 69,824 net tons total, five diesel motor vessels of 5668 net tons total; four tugs of 239 net tons total, and six bulk barges of 4845 net tons total.

Tank car loadings were increased by 7070 and the total mileage of the company's owned and leased cars was increased 5,840,043 miles.

The company's gasoline sales were 8.6 per cent more last year than in 1926. Lubricating oil sales were increased 7.8 per cent, asphalt sales 7.2 per cent, and crude and fuel oil sales 13.2 per cent.

Number of bulk and service stations of the company were increased by 1021. Motor vehicle equipment was decreased by 52 units and operating expense was lowered 13 per cent.

Export business was at a level with the business of the previous two years, Mr. Holmes reported.

It sold its interest in the Reserve Natural Gas Co. and the Marshall Gas Co. and its west Texas natural gas system.

Taxes paid by the company totaled $24,392,686, an increase of $1,586,474 over 1926 taxes. The taxes were:

	1927	1926
Federal income	$ 2,036,396	$ 4,750,000
Capital stock		129,968
State franchise	272,974	108,888
Production	7[illegible]6,667	813,012
Oil inspection	417,410	482,850
Gasoline	17,219,842	12,885,929
Ad valorem	2,574,101	2,485,411
Licenses, permits	232,699	253,130
Miscellaneous	95,979	
Foreign	756,687	897,023
Total	$24,392,686	$22,806,211

Dec. 31 the corporation had 39,319 stockholders, of whom 14,684 were women.

The accompanying table gives the operating statistics of The Texas Corp. and subsidiaries for 1926 and 1927.

Comparative Operating Data, The Texas Corp. Subsidiaries

Producing Division

	1927	1926
Crude oil produced in U. S. bbls. gross	26,074,864	21,009,199
Crude oil produced in Mexico, bbls. gross	386,819	509,186
Total production, bbls. gross	26,461,683	21,518,385
Crude oil purchased in U. S.	22,859,194	21,190,207
Crude oil purchased in Mexico	1,548,052	2,380,875
Crude oil purchased in Venezuela		67,886
Producing oil wells Dec. 31 in U. S.	5,811	5,450
Producing oil wells Dec. 31 in Mexico	27	25
Oil wells completed in U. S.	402	418
Oil wells completed in Mexico	3	1
Gas wells completed in U. S.	35	20
Dry holes drilled in U. S.	173	152
Dry holes in Mexico	3	4
Oil wells abandoned in U. S.	142	56
Oil wells abandoned in Mexico	2	1
Wells drilling Dec. 31 in U. S.	70	108
Wells drilling Dec. 31 in Mexico	2	1
Acreage held in fee Dec. 31 in U. S.	561,180	518,025
Acreage held in fee Dec. 31 in Mexico	2,242	2,242
Acreage held under lease Dec. 31 in U. S.	2,166,803	1,736,544
Acreage held under lease Dec. 31 in Mexico	6,295	6,407
Acreage held under lease Dec. 31 in Venezuela	106,367	106,367
Number of gasoline plants Dec. 31	19	18
Natural gasoline production, gals.	23,146,249	19,586,960
Natural gas produced, M. cu. ft.	12,686,920	14,207,810
Gas wells end of year	87	85
Pipe line runs of oil, bbls.	39,939,655	34,951,024
Crude delivered to refineries, bbls.	33,925,506	29,539,305
Crude transported for others, bbls.	3,512,813	6,724,814
Trunk oil pipe line mileage	2,554	2,280
Loop and branch oil line mileage	748	718
Gathering lines, mileage	1,951	2,031
Gas line mileage	96	319

Refining Division

(Quantities in barrels unless otherwise specified)

Crude runs to stills	38,466,947	36,238,063
Purchased distillates run	380,245	320,881
Gasoline production	18,528,887	16,293,214
Kerosene production	3,095,172	3,231,106
Lubrication oil production	1,558,181	1,455,983
Gas oil production	138,606	480,760
Fuel oil production	10,294,101	10,189,551
Asphalt production, tons	324,394	293,776
Paraffin wax production, tons	1,550	3,084
Roofing production, squares	989,643	971,235
Shooks manufactured	7,760,385	7,431,578
Cases manufactured	8,356,875	7,651,153
Cans manufactured	20,965,130	19,156,635
Asphalt drums manufactured	280,648	234,626
Asphalt barrels manufactured	189,694	198,362

Marine Operations

Cargo carried, bbls.	19,101,517	21,087,454
Fuel oil consumed, bbls.	992,537	1,057,802
Gasoline consumed, bbls.	409	449
Coal consumed, long tons	1,678	1,423
Nautical miles run by ocean vessels loaded	664,266	679,895
Nautical miles run by ocean vessels in ballast	628,364	637,825

Railway Traffic

Tank cars owned Dec. 31	3,816	3,229
Tank cars leased Dec. 31	2,482	2,538
Owned or leased cars loaded	122,064	114,994
Other cars loaded	18,948	18,941
Total mileage owned cars	82,109,460	76,269,417
Average mileage per car	13,545	13,742
Daily average mileage per car	37.11	37.65

Three Phenomenal Wells Set the Pace For the West Texas Fields

By Paul Wagner
N. P. N. STAFF WRITER

WHEN nature starts matching her idiosyncrasies against each other almost anything can happen. West Texas oil operators, therefore, will watch with special interest the producing records of three spectacular wells, one in Crane county and two in Winkler.

Yields of the three wells are not directly comparable, because they have been on production varying lengths of time. The status of each may be studied, however, in its relation to the present combined recovery of 3,000,000 barrels from the three.

The present pace-setter, in terms of total yields, is Landreth Production Co.'s No. 11 Cowden-Anderson, on a narrow excess survey strip separating the University and Gulf-McElroy developments of Crane county. It had passed the 1,500,000 barrel individual well mark in April and was still averaging 5400 barrels daily.

Phenomenal characteristics of this well are shown by comparison of its behavior with per well daily averages in the adjoining development areas and in west Texas as a whole. The 58 wells on the Gulf Production Co.'s 27-section McElroy ranch property, south of the Anderson-Cowden strip, average 272.6 barrels daily. In the University field, which includes the Landreth strip, 224 wells average 211.2 barrels daily; but by eliminating No. 11 from the computation, the average for the other 223 wells drops to 188 barrels daily. On consolidating all west Texas salt basin fields it is found that 1406 wells average 234.1 barrels daily.

In the first 236 days the No. 11 well was on production it gave up 1,425,440 barrels, or at the average rate of 6040 barrels daily. With No. 14, which had produced 518,271 barrels at the end of 219 days, the two wells accounted for nearly two-thirds of the Anderson-Cowden strip total. The strip now gives up 8136 barrels daily from 16 wells, including both Nos. 11 and 14 which are responsible for the high per well average of 508.5 barrels daily.

Tabloid Production Record, West Texas Salt Basin Fields

County	Number Wells 4-21-28	Daily Production Per Well 4-21-28	Cumulative Prod. Bbls., 4-1-28	Date of Discovery of Field
Crane	282	223.9*	31,559,638	March, 1926
Crockett	40	70.2	1,050,290	May, 1925
Ector	3	3.33	.....	.....
Glasscock	4	.....	.....	.....
Howard	140	28.3	1,673,190	April, 1926
Loving	2	53.0	15,000x	.....
Mitchell	140	22.0	5,114,477	Oct., 1920
Pecos	187	272.4**	9,666,218	Oct., 1926
Reagan	206	92.5	31,994,338	May, 1923
Upton	263	46.2	10,136,727	Sept., 1925
Winkler	139	1530.0**	14,798,720	Nov., 1926
	1406	234.1	106,008,598	

*—Consolidates University and Gulf-McElroy fields, averaging respectively 211.2 barrels from 224 wells and 272.6 barrels from 58 wells.
**—Wells pinched.
x—Estimated.

Next to the No. 11 Cowden-Anderson for individual well productivity in west Texas comes the Southern Crude Oil Purchasing Co.'s No. 1, Tract 88-B, Sec. 4, block B-12, near the south end of the Hendricks field, Winkler county. It was still making 4780 barrels daily, the middle of April, after producing more than 1,000,000 barrels of oil.

Total lease production of tract 88-B was 1,091,481 barrels, April 1. The well came in for about 5800 barrels, daily maximum, early in August, 1927. Only a nominal quantity of oil has been produced by a second well on the property that came in a few weeks ago making large percentages of salt water.

The completion for which the Landreth and Southern Crude wells have set a pace is the present spectacular C-1 Hendricks of Cranfill & Reynolds, Inc., in the north end of the Winkler area. Cranfill & Reynolds have kept their well pinched far below its maximum. Notwithstanding, it produced 359,893 barrels in March and promised to pass the 750,000 barrel mark in April.

When brought in, March 1, the well was pinched to about 11,000 barrels daily, although rated by its owners as good for 50,000 barrels open flow. It has been exploited at varying rates up to 15,000 barrels daily since that time.

Other big wells of Southern Crude Oil Purchasing Co., the Atlantic-Collett partnership and the Humble Oil & Refining Co., which constitute an offset group, have not perceptibly affected the flow of the Cranfill & Reynolds "gusher."

A comparison of producing values in the Winkler area is made by taking the field total of 139 wells, averaging 1530 barrels daily, and considering them in relation to the Southern Crude and Cranfill & Reynolds "gushers." It is true that many Winkler wells are pinched below maximum producing capabilities, but so is the Cranfill & Reynolds completion.

Latest estimates credit the Winkler area with potential open flow production of roundly 322,000 barrels daily, despite the fact that 80 wells are showing varying degrees of water with the oil.

A record of wells making water, April 15, shows;

Water Percentage	Number Wells
Less than 1%	2
1-10%	18
10-20%	18
20-30%	7
30-60%	20
60-90%	15
Total	80

The future productive area of the county has been only partly defined and Hendricks field limits, similarly, are such that they are certain to be pushed out considerably in advance of present development.

Highest estimates of productive ground to be proved in Winkler county call for about 16,000 acres, as compared with a present area about

West Texas Sulfur Crude Storage, By Companies

(Figures in Barrels as of April 1, 1928)

COMPANY	Ward County	Winkler County	Midland County	Crane County	Upton County	Crockett County	Reagan County	Mitchell County	Howard County	Val Verde County	Pecos County	Totals
American	622,830	117,490	.....	.....	.....	.....	.....	.....	.....	.....	.....	740,320
Independent	104,155	187,240	.....	51,830	.....	.....	.....	.....	.....	.....	.....	343,225
Landreth	363,335	180,280	.....	.....	.....	.....	.....	.....	.....	.....	.....	543,615
Southern	787,820	131,180	.....	112,130	103,725	.....	.....	.....	.....	.....	.....	1,134,855
Texon	149,500	257,575	.....	.....	.....	.....	.....	.....	.....	.....	.....	407,075
Atlantic	.....	355,270	.....	.....	.....	.....	.....	.....	.....	.....	.....	355,270
Gulf	.....	1,251,700	534,800	45,810	67,330	24,425	.....	.....	.....	.....	6,700	1,930,765
Humble	.....	116,350	.....	115,460	439,660	.....	832,060	.....	.....	.....	38,240	1,541,770
Magnolia	.....	432,000	1,432,030	174,000	.....	.....	.....	311,190	221,150	.....	.....	2,570,370
Pure	.....	98,010	.....	.....	.....	.....	.....	.....	.....	.....	.....	98,010
Shell	.....	467,900	.....	.....	160,230	.....	.....	.....	.....	.....	13,770	641,900
Turman & Maxwell	.....	354,430	.....	.....	.....	.....	.....	.....	.....	.....	.....	354,430
Illinois	.....	.....	.....	.....	106,355	.....	.....	.....	.....	1,608,450	68,400	1,783,205
Marland	.....	.....	.....	13,625	698,490	.....	353,175(a)	.....	.....	.....	.....	1,065,290
Prairie	.....	.....	.....	160,000	801,090	.....	.....	.....	.....	.....	.....	961,090
Texas Pacific	.....	.....	.....	.....	66,030	.....	.....	.....	.....	.....	.....	66,030
The Texas Co.	.....	.....	.....	5,125	3,420	.....	.....	.....	.....	.....	.....	8,545
Church & Wheatley	.....	.....	.....	162,000	.....	.....	.....	.....	.....	.....	.....	162,000
Eastland Oil	.....	.....	.....	950,000	.....	.....	.....	.....	.....	.....	.....	950,000
Simms-Atlantic	.....	.....	.....	1,966,200	.....	.....	.....	.....	.....	.....	.....	1,966,200
Simms	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,590	16,590
Big Lake	.....	.....	.....	.....	.....	.....	599,200	.....	.....	.....	.....	599,200
Pecos Oil Co.	.....	.....	.....	703,735	.....	.....	.....	.....	.....	.....	.....	703,735
Totals	2,027,640	3,949,425	1,966,830	4,459,915	2,446,330	24,425	1,784,435	311,190	221,150	1,608,450	143,700	18,943,490

(a)—Reagan County Purchasing Co., controlled 51 per cent by Marland.
(b)—Winkler and Ward county stocks consist entirely of Winkler crude.
(c)—Midland stocks include both Winkler and Crane county crudes.
(d)—Reagan figures cover Big Lake crude, except working stocks at Humble's pipeline concentration base.
(e)—Val Verde stocks consist entirely of Pecos crude moved away from Yates field.

six miles long, north to south, and roughly a mile and a half wide. A minimum ultimate recovery of 150,000,000 barrels has been set up. Some estimates reach to double that quantity. Only in the Winkler area and the University field of Crane county has daily average production reached above the 100,000 barrel daily mark in west Texas. Diversified leaseholds brought the University field development to a peak of about 135,000 barrels daily last year. At the time this was written the Winkler high mark had been roundly 240,000 barrels daily, reflecting competitive drilling partly made necessary by flush production of "gushed" wells on small tracts in the north end of the Hendricks field.

Despite shut-in potential production estimated at more than 1,000,000 barrels in the salt basin region, University field and Winkler county have been the only producing areas to get out of hand at any time in the past. Pipeline agencies serving University field prorated the oil that could be moved to market last year and considerable quantities of storage stocks were built up there. Then came Winkler and the resulting action of the Railroad Commission of Texas in prorating its production under the conservation statutes.

Howard county, with nearly a dozen wells capable of yielding 25,000 barrels or more of sulfur crude daily, remains shut down in the deep lime producing area. About 4000 barrels daily of "sweet" crude produced in Howard county comes from the Chalk shallow area, which adjoins the Roberts-Settles deep lime territory.

To prevent a possible repetition of the Winkler situation, resulting from diversified lease ownership in the Roberts-Settles area, the railroad commission called a Fort Worth meeting, April 28, to consider prorating measures.

Yates field of Pecos county, with more than 1,000,000 barrels of potential daily production (estimated on 1-hour tests of wells) shut in, continues to market about 51,000 barrels daily.

Big Lake field, in Reagan county, considered good for 100,000,000 barrels ultimate yield, never exceeded 46,000 barrels daily field average and is now exploited by the two companies owning it at about 18,500 barrels daily.

Westbrook-Iatan, in Mitchell county, World pool, in Crockett county, and the McCamey district of Upton county have been small fields so far.

The Connell, Ector county, Waddell, Crane county, and Wheat, Loving county, areas constitute one and two well discoveries under operating control. The Scarbauer two-well field in northern Winkler county is similar to these.

Reference to the American Petroleum Institute production summary published each week in NATIONAL PETROLEUM NEWS will show west Texas salt basin daily average yields, by counties and fields. These may be checked for clearer picturization against the combination field-pipeline and geological map published on page 22 of its April 11, 1928 issue.

In checking the A.P.I. summary mentioned Jones county production should be eliminated from consideration of the sulfur crude area. Although geographically in west Texas, northeast of Mitchell county, it is in another geological province and its crude is "sweet." The 4000 barrels daily now being produced in the Chalk shallow area of Howard county also classifies as "sweet" crude.

Cumulative production figures shown in an accompanying table take account generally of sulfur crude fields, ignoring the "sweet" oil recoveries in Jones county. As some Howard county sulfur crude was brought above ground before the Roberts-Settles field wells were shut in, it was impossible to segregate the "sweet" and sulfur oil. The "sweet" oil from the Chalk field, therefore, is included.

By taking account of Jones county production, amounting to around 850,000 barrels to date, the west Texas total since the Westbrook discovery of Mitchell county, in 1920, reaches almost to 107,000,000 barrels.

The accompanying table also shows the number of wells producing by counties, and fields, together with per well daily average yields.

Another table shows west Texas storage stocks of sulfur crudes, totaling nearly 19,000,000 barrels. A study of the distribution of this storage shows how successful operators have been in their attempt to stock as little of this oil as possible.

Only University field and Winkler crude, principally the last mentioned, have been stocked in large quantities. All Ward and Winkler county figures apply to Winkler crude; Crane county stocks reflect University field tankage except for 45,810 barrels in Gulf-McElroy lease tanks; and Midland county storage combines both Crane and Winkler crude at the pipeline concentration bases of the Magnolia and Gulf companies.

Elsewhere, notably in Pecos county, the policy of bringing sulfur crude above ground only as moved into marketing channels is reflected by the relatively low stocks on hand.

As compared with present daily average production of the salt basin region fluctuating around 360,000 barrels daily, trunk pipeline runs average about 144,500 barrels daily; topping plant refineries local to the region fluctuate from 22,000 to 24,000 barrels of crude consumption daily and tank car shipments were at their highest daily average for a 10-day period in April, when they reached 58,530 barrels.

Consolidation of these figures showed roundly 225,000 barrels of salt basin sulfur crude moving into market channels and between 130,000 and 135,000 barrels daily going to storage.

Irregularities in Density, Rate of Flow Problems of Wet Gas Measurement

By R. D. Turner*

(Read before Southwestern Gas Meter Course, University of Oklahoma at Norman, April 24, 1928)

IN THE natural gas and the natural gasoline industries of today, gas measurement plays an important part. Its importance to the natural gasoline industry can well be realized when reminded of the fact that in round numbers, one-third of the gasoline produced, or over one and a half million gallons per day having a value of more than $78,000 even at present prices, is given in exchange for the casinghead gas.

The cost of the gas is the largest single item of expense to a gasoline plant, and thousands of dollars may be lost annually through an indifferent attitude toward gas measurement. The importance of gas measurement is also reflected in the effciency of plant operation. It is important that the plant operator know the quantity and richness of the gas he is handling in order that he may properly control the operation of his plant and obtain the highest degree of efficiency.

Since most casinghead and natural gas in the field is measured by orifice meter, the discussion in this paper refers largely to such measurement.

As casinghead gas, or "wet gas" as it is often termed, is in most cases handled under vacuum, one of the first and most difficult problems pertaining to plant operation and gas measurement is air infiltration. While this may be considered an operating problem, nevertheless, it devolves upon the meter men and gas measurement department to be constantly on the alert for air leaks, and make the proper adjustments in the meter readings.

Air tests should be made at least once a day, and at plants where extremely high vacuum is required, such tests should be made more often. Aside from being dangerous to plant operation, air adds excess volume to the amount of gas purchased, overloads the machinery, and if not eliminated, consumes a great part, if not all, of the annual profits of a gasoline plant. Owing to the fact that the present type of gas meter will measure air in precisely the same manner as gas, the infiltration of air is difficult, and sometimes impossible, to detect through the meter readings alone.

However, if the chart changers are alert and on to their jobs, they can be of great assistance in the detection of air leaks, especially on settled leases, for they are familiar with the charts they are handling from day to day, and usually by observing the differential carefully, they can tell if the meter has registered a large or sudden influx of air, and any such irregularities should be immediately investigated and reported.

As casinghead gas is the gas coming from the same sand or stratum as the oil, and since the marketing of such gas is usually subservient, or incidental, to the production of oil, many perplexing problems on this account confront the gasoline manufacturer. The success of the gasoline manufacturer depends a great deal on the co-operation given by the oil producer, the kind of tanks and equipment from which the gas may be taken, the care of oil and gas separators, etc.

An arbitrary, or indifferent, attitude on the part of the oil operator, such as leaving the vacuum lines open to the air when cleaning out or running tubing, leaving gate valves and flow tanks open so that air will be carried in, cutting wells in and out without notifying the gasoline plant, will cause no end of grief to the gasoline manufacturer.

Perhaps the greatest problem confronting the gasoline manufacturer, especially during the flush production stage, is getting the gas into the plant. This problem is greatly aggravated on account of the different methods which the oil producers use in the production of their oil. Some producers desire back pressure carried on their wells, while others want atmospheric pressure, or perhaps vacuum.

Some of the gas is made available from pressure tanks of suitable gas traps, while in other cases the gas must be taken from flimsy paper shell tanks, all of which make difficult the regulation of the gathering system, metering, and the processing of the gas in the gasoline plant. During the period of flush production, the gas is usually taken from flow tanks or separators, and it is not an unusual occurrence, especially from wells that are flowing by heads, to get a slug of oil into the vacuum line, and hence, into the meter and connections, which usually necessitates a replacement of the mercury, and a general cleaning of the meter piping and fittings.

TO OVERCOME this difficulty, it has been necessary in some instances, to place a scrubber tank between the flow tank and meter, and install a small drip, filled with excelsior, on each side of the meter setting. It is also difficult to get an accurate measurement from a well that is flowing by heads. When the well is flowing, gas may be passing the orifice plate at the rate of several million feet per day, forcing the differential pen to the extreme edge of the chart, and when the well stops flowing, there is hardly enough gas to make a registration on the chart.

Gas flowing under these conditions usually produces a chart of the "sunflower" type which makes the calculations tedious.

After the period of flush production has passed, there usually comes a period of cleaning out and swabbing. Measuring gas from a swabbing well is perhaps the most difficult of all wet gas measurement, at least from a chart reading standpoint. When the swab is being pulled, a large

The problem of accurately measuring casinghead gas from which natural gasoline is to be extracted is one which is commanding close attention of both gasoline manufacturers and gas producers. Accuracy is essential to the gasoline manufacturer, particularly when market prices are low. The accompanying paper throws some light on this subject.

The Natural Gasoline Association of America has had a special committee working for more than a year on the problem of testing gas densities as an auxiliary to accurate metering. The committee will report its findings soon.

At the Meter School at the University of Oklahoma nearly 100 representatives of buyers and sellers of wet gas were present to hear the results of the study of measurement problems read by R. D. Turner of the Skelly Oil Co.

*Skelly Oil Co.

volume of gas will be received, and when the swab is being lowered in the hole, a slight vacuum is created, which not only retards the flow of gas during this operation, but causes gas, quite often, to back flow through the meter.

Like the well flowing by heads, it makes a very erratic chart, and if an accurate reading is desired, the chart should be read in 15 minute periods rather than hourly. A much nicer chart may be had by placing "dampeners" or "deadeners" in the meter, but this practice is usually unsatisfactory as it merely retards the flow of mercury from one chamber to the other, makes the meter sluggish and consequently inaccurate, and it is therefore a question whether the gas buyer or gas seller is getting the best of the deal.

It is my opinion that a much more accurate reading will be had if the meter is left to record all flows of gas, and by reading the charts, if necessary, in 15-minute periods. However, in some instances, if a record of the flow is to be had at all, it is necessary to install "deadeners" in the meter.

As a general rule, and quite different from the general practice of dry gas measurement, one meter handles all the wells on each particular lease. The number of wells usually range from one to 16 to a quarter section, and in some instances even a greater number. The writer is familiar with situations where as many as twenty-three wells feed through one meter on a quarter section.

WITH a large number of wells feeding through a meter, it is quite probable that the flow of gas will be irregular, especially in new fields where considerable cleaning out, rod and tubing jobs are necessary. This requires a frequent change of orifice plates, which in turn changes the value of the gas coefficient used in calculating the volumes.

It is also often necessary in flush and semi-flush stages to make new gravity and gasoline content tests when the wells are turned in and out, as the wells may vary considerably in richness.

Measurement of gas by means of an orifice meter requires an accurate determination of the density of the gas, and this is of particular importance in measuring casinghead gas, the densities of which vary through a much wider range than those of dry gases, and where errors in gas volumes may be of considerable magnitude if densities are not properly determined. Casinghead gas will range in density from .60 to more than 2.0, as compared with air, and the determination of the specific gravity of such heavy gases is attendant with so many variables, because of condensable constituents, that unless great care and proper equipment are used, erroneous results may be obtained.

A very perplexing problem of wet gas measurement is pulsation. The principal causes of pulsation are pressure variations from the compressors or vacuum pumps, and condensation in the lines. The latter cause can usually be remedied by placing drips in the low places along the gas line. In the measurement of wet gas it is necessary to blow the drips at least once a day, and during the winter months, especially at plants handling very rich gas, it is necessary to blow them three or four times a day.

There are some plants that receive a good portion of their production from the drips. It is obvious that if this condensation were left in the lines, accurate gas measurement would be impossible. We have found the orifice meter to be more satisfactory than the positive meter in the measurement of extremely rich gas. If the vacuum lines are kept free of condensation, an accurate measurement may be obtained, while with the positive meter, it is practically impossible to keep the diaphragms and other working parts free of condensation.

Pulsation caused by compressors or vacuum pumps is the most difficult to overcome. It is like trying to weigh a person who is jumping up and down on the scales. Pulsation can be eliminated in order to make a smooth chart by placing "deadeners" in the meter, but as previously mentioned, this practice is usually followed at the expense of accuracy. It has been found to be very helpful in trying to eliminate pulsation, to use a larger pipe for the meter setting than the line. For example, on a 6-inch line, to use an 8-inch setting, and on an 8-inch line, to use a 10-inch setting, etc.

In recent developments of the technology of the petroleum industry, it has been shown that gas lift and repressuring have become important factors in the production of oil, which fact presents many problems to the gas measurement division in controlling the volume and pressure of the gas being injected and its subsequent return to the gasoline plant or compressor station. Steady volume and uniform pressure are essential to the successful application of the gas lift.

The type of meters most generally used in wet gas measurement at the present time are the 20-inch and 50-inch differential range orifice meters. However, where exceptionally large volumes are being handled, meters with 100-inch differential range are often used, while in case of small volumes under vacuum, the 10-inch differential range meter is often used. The 10-inch range meter is particularly adaptable at plants where extremely high vacuum is being maintained, such as at Burkburnett and the Glenn pool.

When very high vacuum is required, it is necessary, in order to reduce the friction loss to a minimum, to have as large an orifice opening in the line as possible within the limits of orifice measurement, while at the same time maintaining a differential pressure high enough to insure accuracy. Two or three inches of water differential, therefore, on a 10-inch meter would be satisfactory.

Many other problems might be mentioned if time were permissible, but in conclusion, I wish to say in summary that in the measurement of wet gas, the three factors contributing most of our difficulties, in the order of their importance, are as follows: irregularity of flow, variation in the density of the gas, and measurement at extremely low pressures. Considerable progress in the measurement of wet gas has been made in the past few years, and I believe that with concerted effort on the part of gas men and meter companies, many of our present difficulties will be overcome in the future.

Pennsylvania Dealers Plan Organization

CLEVELAND, April 30.—An effort is being made by service station operators of Altoona, Pa., and surrounding territory to organize the Independent dealers of Pennsylvania into local petroleum clubs and eventually a state association.

About 125 dealers met April 25 at Altoona to discuss organization. They were addressed by W. A. Milne, executive secretary of the Ohio Petroleum Marketers Association, who told of the petroleum clubs and state association organization in Ohio. Frank W. Lovejoy, Vacuum Oil Co., spoke on merchandising.

The county in which Altoona is situated and two other counties have already been organized. There were representatives from seven other counties at the Altoona meeting.

An effort will be made to get station operators in most of the state to organize. One of the preliminary tasks will be to get volunteers to assist in the organization work.

The Blair County association of which Altoona oil men are members, has a membership of approximately 125. These are individual station and not chain station operators. Neither are they jobbers, although jobbers and large company representatives may be taken in as associates. The members of the Blair County association made an initiation fee of $5 and $1 a month dues.

Officers of the Blair county association are H. C. Young, president, and A. W. Martin, secretary.

Oil Field Practice Manual is Proposed By A. P. I. Production Engineers

By Paul Wagner and John Power
N. P. N. STAFF WRITER

FORT WORTH, April 30 DRILLING practices to be recommended by the American Petroleum Institute division of development and production engineering may be incorporated into a manual. This was suggested at the Fort Worth organization meeting, April 25, of the Texas-Louisiana-Arkansas district, by Carl A. Young, Dallas, executive secretary of the division.

The manual would include drilling methods, casing sizes and requirements, completion practices, production equipment and fundamentals governing solution of problems local to the various fields. The proposal was generally endorsed by the hundred, or more, petroleum engineers and field men in attendance.

Election of Adrian C. Moore, Rycade Oil Corp., Houston, as vice chairman, and W. H. Meiers, Atlantic Oil Producing Co., Dallas, as secretary, completed the Texas-Louisiana-Arkansas district organization. R. B. Kelly, Pure Oil Co., Fort Worth, had been previously appointed district chairman by John R. Suman, Humble Oil & Refining Co., Houston, who heads the development and production engineering general division.

District committees on membership and program were announced by Chairman Kelly as follows:

Membership—J. Elmer Thomas, consulting geologist, Fort Worth, chairman; Frank Gardner, Simms Oil Co., Dallas; A. W. Peake, president, Dixie Oil Co., Inc., Shreveport; W. D. Brookover, production manager, Panhandle Refining Co., Wichita Falls; W. C. Thomas, production manager, Vacuum Oil Co., Houston.

Program—W. H. Meiers, Atlantic Oil Producing Co., Dallas; "Bob" Ames, Elliott Core Barrel Co., Houston; S. M. Gladney, production superintendent, Sun Oil Co., El Dorado, Ark.

Officers are also ex-officio members of both committees.

Frank discussions marked the three engineering papers presented at the meeting. A paper by Melbert E. Schwarz, Rio Bravo Oil Co., Houston, on "Modern Deep Well Drilling Practice in the Gulf Coast of Texas and Louisiana" closed the morning session. At the afternoon session F. S. Seeley, district superintendent and Clyde V. Temple, production engineer, of Humble Oil & Refining Co., discussed "Drilling and Production Practices in the Permian Basin of West Texas."

L. L. Bechtel and William O. Blenkarn of the Midwest Exploration Co., Amarillo, dealt with the subject of "Combating Paraffin and Associated Production Problems in Texas Panhandle." In their absence, the paper was read by S. M. Greenidge, petroleum engineer, of Texas Pacific Coal & Oil Co., Fort Worth.

Abstracts of the three papers follow:

Air Lift Steadies University Field Wells

F. S. Seeley and Clyde V. Temple, of Humble Oil & Refining Co. reported the same remarkable results had not been accomplished with the air/gas lift in the Church & Fields (University) pool of Crane county as in other parts of the country. This field is the only one in the west Texas sulfur crude area where air/gas lift has been carried beyond experiments.

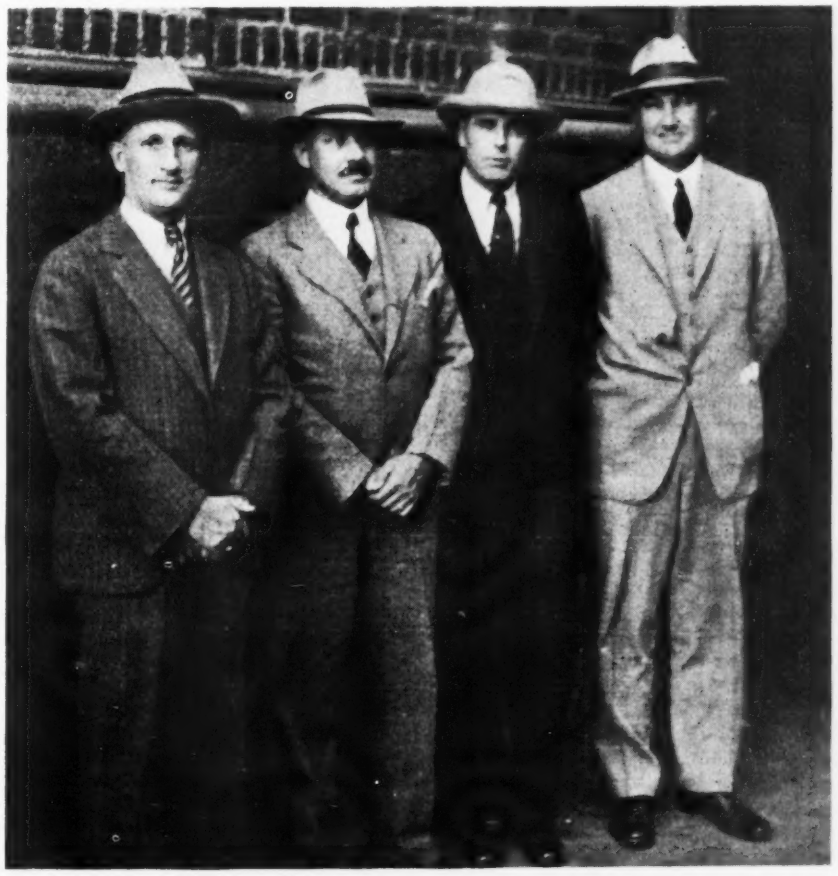
They reported some Church & Fields pool wells have been increased possibly 50 per cent of their initial productions, while others have shown little if any gain. There have been definite indications, however, that production was steadied up and maintained over a period; and that, if the air lift had not been applied, the wells would have been on the pump a short time after completion.

There have been three stages of production employed throughout the Church & Fields area, namely, natural flowing, air/gas lift and pumping. Where the formation has sufficient contained gas to flow the wells, as the production declined, shooting has been resorted to, further increasing production and prolonging the natural flowing stage.

Surface equipment, such as well head connections, traps or separators and stock tanks have been of conventional design and in common use elsewhere.

Separator for Each Well

Common practice has been to provide a separator for each well. Some



Left to Right—John A. Suman, Humble Oil & Refining Co., Houston, general chairman A. P. I. division of development and production engineering; W. H. Meiers, Atlantic Oil Producing Co., Dallas, secretary, Texas-Louisiana-Arkansas district; R. B. Kelly, Pure Oil Co., Fort Worth, district chairman; Carl A. Young, Dallas, division executive secretary and A. P. I. Standardization director

of the operators favored placing it away from the well and holding high enough back pressure to force the oil to the stock tanks. Others have placed separators on structures at the derricks, allowing the oil to gravitate to the stock tanks. The last mentioned method gives wider range of control over back pressures.

The authors stated their belief that this arrangement is proper, because a flowing well should have the same benefits as an air lift well; the placing of traps in this manner on air lift wells has been definitely proved advantageous.

"The gas-oil ratio, or gas factor, has been comparatively low," they said, "averaging between 500 and 1000 cubic feet per barrel. There have been ratios observed as low as 350 cubic feet per barrel while the well was flowing steadily.

"Back pressures have been held low only for fuel purposes or for lifting the oil to the stock tanks; the reason for this being a low formational pressure, possibly not more than 500 pounds or 600 pounds initially. By maintaining a low back pressure the differential across the face of the formation is increased."

With few exceptions, all the wells have been shot, some four or five times. The shots vary from what could be considered squibbing to one 1000-quart shot. The average shot is 100 to 200 quarts. There has been no uniformity of shot sizes, because each well had its own peculiar conditions, such as quantity of fluid, position of oil string, whether cemented or not, thickness of pay, all determining the size of shot.

Two Stages in Flowing

In the natural flowing period of a well, Humble Oil & Refining Co. has considered it in two definite stages. First, when the well is brought in it is allowed to flow steadily through 6⅝-inch casing until the gas volume has fallen off and the well first starts to head. This heading condition has been determined by placing orifice meters on the discharge lines from the separators. When the well first shows signs on the chart of heading then preparations are made to run proper size tubing.

The orifice meter, or pressure recording gauge, has been found to have an important part in determining when to run tubing, because the charts will indicate a heading condition within the well that will not be in evidence for a week or more by discharge gas or production.

After tubing is run the well is flowed through tubing until signs of heading are again in evidence. The well is then either put on air lift or the pump.

"We have in mind in this procedure," said Messrs. Seeley and Temple, "the delivery of all the oil possible to the surface by natural forces. At this point it is well to bring out that the problem of increasing the natural flowing period of a well is as important, if not more so, than artificial lifting or pumping."

Flowing through tubing was found almost a necessity because of high depositions of paraffin in the Church & Fields area. It is almost impossible to keep the annular space in a well free of paraffin. With the exception of one company, all operators have flowed their wells through tubing. The paraffin accumulation has given more trouble in air lift wells than in either natural flowing or pumping wells. The higher velocities due to the nature of flowing by air lift are described as leading to more rapid accumulation of paraffin.

Rod Breakage Heavy

Pumping of wells in the Church & Fields area has been difficult because of rod breakage. It is impossible to get any well to pump continuously. Rods have parted as many as three or four times in one 24-hour period.

Water encroachment was described as not having reached a serious stage in the Church & Fields area, notwithstanding that many wells have shown intrusions for months. Initial oil productions have ranged from 30 or 40 barrels to as high as 8000 barrels daily.

The Hendricks development area of Winkler county is another west Texas field which, like the Church & Fields territory, has presented unusual production problems. Various methods have been used in attempting to shut off water encroachment, but it was considered by Messrs. Seeley and Temple a debatable question as to just where the water is coming from.

At times it has been necessary to employ all the ingenuity available to treat and prepare Winkler oil for the pipeline. This, by necessity, has developed a very efficient method of handling fluid and oil on the leases. High gas pressure and volumes have been sources of trouble also.

Virtually all Winkler producers have been flowing wells. A number of wells are pinched, because of limited pipeline capacity and efforts to forestall water encroachment. The discovery well and two offsets are the only one now on the pump.

Shooting was resorted to generally throughout the field. The average size shot has been 200 to 300 quarts. One 980-quart shot was used. Wells that were shot increased their production temporarily, only to settle back to old averages within three or four weeks.

Gas factors have been very low in the south part of the field, averaging about 325 cubic feet per barrel of oil. In the high gas zone of the central part of the field the foot barrel ratios have been as great as 10,000 to 15,000 cubic feet, but the gas volume rapidly decreases as the production increases, giving a lower foot barrel ratio for this area.

Farther north, and lower on the flank of the structure, the gas-oil ratios decrease from 800 to 1000 cubic feet per barrel. In the extreme northern part of the proved area the gas-oil ratios are found to be low, averaging about 300 cubic feet per barrel. Production decline curves on individual wells are of little value, as wells generally are run toegther for treating and it has been impossible to obtain segregated gauges.

With few exceptions the wells in Yates field, Pecos county, were described as flowing natural. Production is pinched, due to proration, and wells are giving up only a small part of their potential. There have been no indications of paraffin troubles such as experienced in the Church & Fields-Gulf McElroy area of Crane county.

Deep Drilling Practice in Gulf Coast Fields

In introducing his paper Melbert E. Schwartz, production engineer of the Rio Bravo Oil Co., Houston, gave a resume of some deep wells completed in the Gulf Coastal Salt Dome area of Texas and Louisiana. He pointed out that many of these wells had been deepened holes which had not been originally intended for deep tests. This condition had naturally reduced the clearance between the bore hole and the drill pipe, increasing the hazards and slowing up the rate of the deeper drilling.

One of the earliest deep wells completed in the Coastal area was the Rycade Oil Corp., Cow Bayou A-5, in the Orange field, Texas. This test, which was a dry hole at total depth of 5980 feet, was drilled in the bayou in 18 feet of water, with the derrick set on pilings.

Drilling was easy, no difficulties being encountered until a gas shale was penetrated at 5800 feet. About 90 feet of 18-inch lapweld casing, 1400 feet of 12½-inch, 50-pound lapweld casing, 3000 feet of 9¼-inch 36-pound seamless and 3800 feet of 6⅝-inch, 28-pound seamless casing was set. Fairly large rotary equipment was used.

The deepest well drilled to date in the Pierce Junction field, Texas, is a dry hole at 6182 feet, which was planned as an offset to a 4400-foot producer. The casing required included 1248 feet of 10-inch 35-pound lapweld, and 4508 feet of 6⅝-inch, 24-pound seamless. As the 6⅝-inch had been cemented on top of the sand to test it, the well was deepened with a 6¼-inch hole. A solid body of sand rock from 5300-5590 was cored with a 6⅛-inch core drill, the core hole being reamed with a 6¼-inch cone bit. Thirty-six days were required to drill this formation.

Fast Drilling Time

One of the fastest drilled holes in this field was the Leonard Settegast

No. 1, completed at 5930 feet in 93 days' drilling time. The 5600-foot string of 6⅝-inch, 24-pound seamless casing stuck and parted about 200 feet off bottom, necessitating setting 4¼-inch on top of the sand.

In the Lockport field, Louisiana, Vacuum Oil Co. completed its No. 2 Freeburgh-Wolf in an 8¼-inch hole at 6075 feet. It had been necessary to sidetrack the 6⅝-inch and 4¾-inch casing set on top of the sand at 4800 feet.

In the Spindletop deep flank field, Texas, several wells have been completed below the 6000-foot level, the deepest being the Yount-Lee Oil Co. McFaddin 43, at total depth of 6576 feet.

In this area some companies, particularly the Gulf Production Co., are using electric drilling power. The electrical equipment used with the regular rotary equipment includes 1-100 h.p. oil field motor with a 100 h.p. reduction gear, two 25/65 h.p. with 6¾ x 12 slush pumps, and gas proof, oil immersed controls. The Hild drive equipment is also electrically operated, using two 25/65 h.p. motors.

Wells using these sizes of motors have been drilled to 5100 feet. For deeper drilling it is planned to equip the draw works with 150 h.p. motor, and the pumps with two 75 h.p. motors.

Derricks Set Above Ground Level

Derricks are practically all 122-foot galvanized steel or wood, with 24 or 26-foot base and re-inforced with pipe, angle iron or extra windlegging. They are generally set either four or six feet above ground level, the advantage of the latter being that it is possible to assemble the Christmas-tree under the derrick floor, where it is out of the way in case it is necessary to drill in through a blow-out preventer.

As many of the wells are drilled in swamps and marshy country the derricks are often interesting feats of engineering. In the Sweet Lake field, where the wells are drilled in 8 or 10 feet of water, the bottom is comparatively level, so that a mat is laid 80 x 40 feet, consisting of 2 x 12's, four layers thick, with alternate layers crossed. The mat is sunk on the location and upon it a network of 8 x 12-inch cribbing is built up to serve as the derrick foundation.

In other instances, where conditions are not so favorable, it has been necessary to drive piling for the foundation. Roxana Petroleum Corp. No. 1 Allen-Bernard, one of the deepest pumping wells on the Gulf Coast, at total depth of 5337 feet and a pumping depth of 4800 feet, is produced with pumping unit mounted on pilings. There is very little vibration, a sure sign of the stability of the foundation.

The enclosed type of steam drilling engine, either 11 x 11 or 12 x 12, is gaining favor in this area, as it provides better lubrication for main bearings, crank pins, connecting rod bearings and cross heads.

Heavy Duty Draw Works

The most common draw works is the three speed, air-cooled heavy duty type. There are three supports mounted on steel posts with plain babbitt-lined bearings on the line shaft and either plain babbitt lined bearings or bronze oil ring bearings on the drum shaft. Nearly all are equipped with brake equalizer, line spooler and automatic cathead.

The rotaries are all chain driven, roller bearing, make-and-break type, with either 19 or 20-inch tables. Of necessity, many of the holes have been drilled with lighter equipment than ordinarily would be deemed advisable. With the advent of still deeper drilling, Mr. Schwarz says that the heavy types probably will be used.

Pumps are usually set off the derrick floor on a platform at ground level, insuring a minimum lift of mud fluid from the pit. The usual installation calls for two large mud pumps, 14 x 7¼ x 14 or 14 x 7¼ x 16, with 8-inch suction and 3-inch discharge lines. As greater depths are reached the pumps are equipped with smaller liners, decreasing the volume of fluid and increasing the pressure. By compounding the pumps and reducing the liners, pressures exceeding 2000 pounds can be developed.

Rotary swivels are 6-inch extra-heavy all-steel roller-bearing type, with 3 or 4-inch bail, equipped with safety chains attached to the hose.

Either 6-inch or 8-inch Wigle spring hooks are used in conjunction with extra-heavy elevators having 2½-inch or 3½-inch x 6-foot links. The traveling blocks are the three or four sheave type equipped with roller bearings. The usual practice is to string up a three sheave block until it becomes necessary to use more than six lines.

Method of Lubricating Lines

The crown blocks are of the old type, although heavier and larger than before, that is with 12-inch heavy structural steel I-beams in the frame and using 24-inch sheaves of special manganese steel.

Vacuum Oil Co. has designed a sheet iron shield that fits snugly over the sheaves in the crown block. It contains wick-fed cups, which drop lubricating oil on the line at the point of greatest spread while passing over the sheave. The installation is such that the cover can be raised when it is necessary to work on the sheaves. The new type crown block, which permits aligning the sheaves in the crown block with those in the traveling block, is gaining favor.

Drilling lines are either 1-inch or 1⅛-inch, by 1150 or 1250 feet long, the longer line being preferred. The use of the weight indicator is almost universal after 4000 feet.

Most of the actual drilling is done with fishtail bits of the short face type. The new self-sharpening bits with detachable cutters have had a pronounced success, particularly on wildcats. This is because the cutters and reamers can be replaced cheaper than the ordinary fishtails can be dressed.

Casing Programs

Casing programs in the Gulf Coastal area are often those of expediency. Due to the lenticularity of the producing sand bodies it is imperative that they be tested wherever found. Customary procedure is to set 1200 to 1500 feet of 12½-inch, 50-pound, lap-weld, 3500 to 4500 feet of 9¼-inch, 36-pound, seamless and 5500 to 6000 feet of 6⅝-inch, 26-pound, seamless. This permits running of 4¾-inch, 15-pound seamless, in case it is necessary to get a water shut-off below the 6⅝-inch. The longest string of 9¼-inch casing ever set in the Coastal area is in the Humble Oil & Refining Co.'s Simms-Smith No. 73, where 5266 feet of 9¼-inch, 40-pound, A.P.I. casing was run.

The two greatest difficulties in drilling deep wells on the Gulf Coast are from high pressure gas strata and heaving shale formations. Experience has shown both these conditions can be combated better in a hole of large bore, having the maximum clearance between bore wall and drill pipe, which allows freer circulation.

Customary practice is to spud with an 18-inch hole, using either 6-inch, 25.2-pound, or 5-inch, 22.2-pound drill pipe. This size is carried to a good casing seat at about 1400 feet, and the 12½-inch landed without cementing. The hole is then deepened with the next smaller size drill pipe.

If 4-inch drill pipe is used a fourble of 6-inch drill pipe is run on the bottom of the string to insure a straighter hole. After the 9¼-inch is landed the 6-inch drill is laid out and the hole drilled with the 4-inch equipped with a long 4-inch drill collar. Every precaution is taken to insure the hole being full gauge.

In the completion of Coastal wells the setting of the strainer is of paramount importance. The oil sand should be gauged to make sure of using the proper size mesh. Most operators prefer to set the strainer with packer sealing off the inside of the casing string. In order to recover the drill pipe it is common practice to pump the casing full of heavy mud, after the strainer has been washed and packer set. The drill stem can then be pulled and the well bailed in.

The Christmas-tree fittings behind the well choke are 2500 to 3000 pounds working pressure. As a safety precaution the valves and blowout preventer are equipped with long handles reaching beyond the derrick floor.

Deeper drilling in the areas mentioned has emphasized the advantages

of larger rotary equipment and the necessity of setting larger sizes of casing.

Combating Paraffin in Texas Panhandle

In their joint paper on "Combating Paraffin and Associated Production Problems in the Texas Panhandle," L. L. Bechtel and Wm. O. Blenkarn, of the Midwest Exploration Co., Amarillo, said that the unusually large deposits of paraffin had caused operators to study new methods of dealing with it.

They said deposits might be divided into two classes, paraffin in tubing or casing and deposits on the face of the sand. In treating the former, the two methods so far developed depended on heat or mechanical operations.

On pumping wells in the Borger district frequent pulling of sucker rods has often been sufficient to keep the wells clean. When the traveling valve is ready to be run back in the hole it is necessary to pack the cage and all openings with cup grease to prevent paraffin from stopping the ball.

In some cases it is necessary to swab the tubing. This is done with soft rope made up in a series of half hitches on a rod. When the rod goes down the hole the rope will stay strung out but, when started back up the hole the rope will bunch at the bottom and scrape the tubing.

When tubing has been pulled it is a simple matter to steam out the paraffin. A steam line is laid to the well head with a short nipple sticking up. A stand of tubing is placed over the end of the nipple and the paraffin blown out of the upper end.

Treatment for Removal

Steam, hot water, and electricity are the three best heat generators for that method of treatment. When possible it is considered best to remove the paraffin without shutting down the well.

One of the first of the heat methods tried was that of running steam or hot water down between the casing and the tubing. This is possible only where little casinghead gas is present and on light wells. One of the chief objections to this method is the danger of getting fresh water in the bottom hole formations, as it is generally recognized that this will cause lime or dolomite to sluff off.

There are two patented processes which, by the use of pressure valves, permit the injection of live steam into the tubing from the casing at the bottom of the well.

It is expected that the greatest improvements in existing methods of removing paraffin will come from greater knowledge of the uses of electricity. Water produced with the oil is the best natural remedy and as water is increasing in the Borger district, the problem is becoming less acute.

Mid-Continent Scouts Told Their Reports Fix Company Policies

Staff Special

GUTHRIE, Okla., April 28

"THE scout's reports, compiled from data gathered by himself and other scouts form not only a record of oil history but also the basis upon which his company executives determine the policy of his company," said Rex L. Dawson, assistant chief scout, Carter Oil Co., at the convention of Mid-Continent Oil Scouts and Land Men's Association convention here April 27 and 28.

"And it is the policy of the company which in the long run determines its prosperity and continued existence," Mr. Dawson continued. He had previously told them their responsibilities had greatly increased not only to their own companies but to other companies because scouts' work had expanded so that it was impossible for one scout to gather the required data in any field. Therefore it was necessary that scouts in a field should cooperate. If one scout's work was unreliable and inaccurate, it meant inaccurate reports for all scouts that relied on the faulty work of the one, he said.

R. S. McFarland, superintendent, land department, Twin State Oil Co., said:

"The best example of efficient cooperation in the oil industry today is the work of the scouts in the development of the Seminole field. A comparatively small number of men, by efficient cooperation in their daily work, were able to report in to their various companies each day a mass of information such as has never been collected in any oil field before.

"This information included a detailed account of hundreds of drilling and producing wells, together with detailed records regarding methods of production and depths of various formations.

"The scouts have been of inestimable value to the geological departments. In many companies the scouts collect most of the data on which sub-surface geological maps are based. They have been largely responsible for educating the drillers to watch for certain formations, instead of merely making hole."

James S. Veasey, chief counsel, Carter Oil Co., addressed the scouts and land men as future executives of oil companies and Independent operators. He said that, as such, they will have to deal with the problem of governmental control of industry. He told them, in substance, that such control should be along lines that would permit the industry to work out its own salvation, building for the future as well as the present, and serving the greatest number, without jeopardizing the inherent rights of the individual, whether person or corporation, to conduct his business as he sees fit.

The future should be as carefully considered as present expediency in formulating policies for the oil industry to follow, he said. To take its rightful place with other vital industries of the world oil must prove its right to do so, he said. To prove this right, the price must be stabilized, both the price the producer within the industry gets for his crude and the price the consuming public pays for the refined product.

In stabilizing the price, the industry can demonstrate its ability to govern its own affairs, at a fair price to the public and at a legitimate profit to itself. To this end, Mr. Veasey said, such legislation as is passed should be directed.

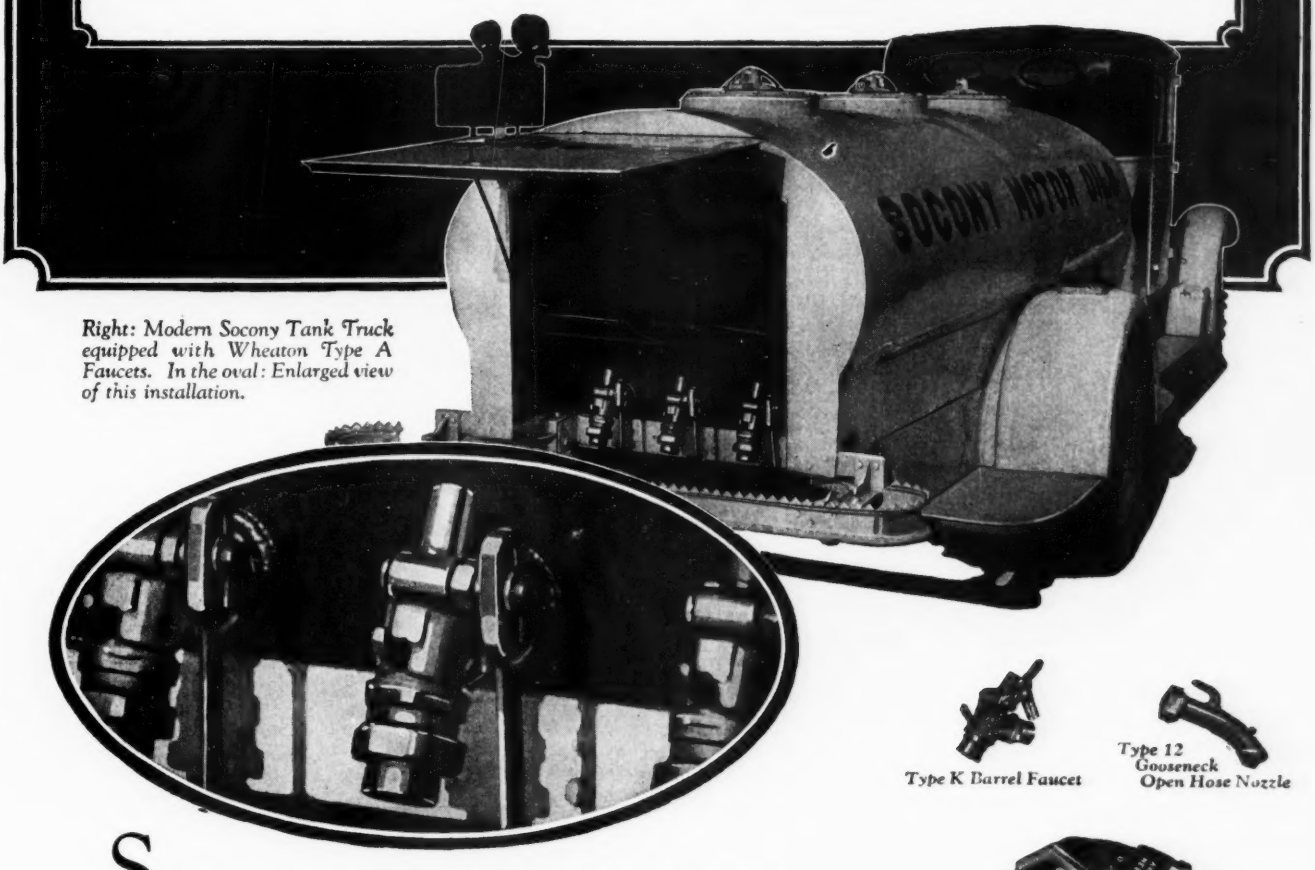
Three oil scouts, said C. N. Haskell, former governor of Oklahoma, played an important part in the formulation of the first state legislation regarding oil, their experience and general knowledge of the needs of the industry being required to make the law helpful to all, and actually applicable to the oil business. The former governor was the signer of the bill which designated the pipe lines as common carriers in Oklahoma.

R. W. Kirchner, Bristow, spoke on the technique of scouting. The ability to cultivate friendships was stressed. The drillers should welcome the scouts' arrival at the rig. News of the day, information on oil development in the area, and information as to local casing records, formation depths in nearby wells and the like, should take the place of the usual cigar passed out by the scout, he said.

At the business session, at the Petroleum Club, Fred J. Hill, Mid-Continent Petroleum Corp., who is stationed in the Seminole district, was elected president, succeeding C. E. Savage, Carter Oil Co. C. R. Welch, land man for the Comar Oil Co., Ponca City, was elected first vice president and "Bob" Brewer, Barnsdall Oil Co. scout at Wichita, Kans., second vice president. Simon Crites, Phillips Petroleum Corp., was reelected secretary-treasurer.

About 100 scouts from Oklahoma and Kansas with a few from Texas attended and their rallying cry, "Bigger and Better Boiler Houses," reverberated through the streets of Guthrie. They registered at the Guthrie Petroleum Club and then got down to the first real business of the meeting, a banquet at the Ione hotel.

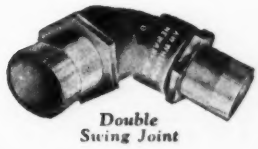
Wherever you see Socony Trucks —you'll find WHEATON Faucets



Right: Modern Socony Tank Truck equipped with Wheaton Type A Faucets. In the oval: Enlarged view of this installation.

Type K Barrel Faucet

Type 12 Gooseneck Open Hose Nozzle



Double Swing Joint

Type 24 Tank Truck Faucet

Type 26 Loading Valve

SOON the second decade will have passed since Standard Oil Company of New York gave their approval to the fine *design, material* and *craftsmanship* which so markedly distinguish Wheaton Products. It was with their characteristic thoroughness that the makers of Socony Products first tested Wheaton Faucets, and then registered their approval in terms of *orders*. But not only was Merit *recognized*—it was given *full rank*: Wheaton Faucets were made *standard equipment* with the Standard Oil Company of New York.

And what can be added to such a recommendation?

A. W. WHEATON BRASS WORKS, NEWARK, N. J.

Wheaton

FAUCETS · VALVES · JOINTS · COUPLINGS · FILLERS · NOZZLES · FITTINGS

Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

Mid-Continent Refinery Operations Week Ended April 27 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	North La.-Ark.	Total Week Ended Apr. 27	Total Week Ended Mar. 30
Plants Reporting	12	28	28	12	80	79
Crude Capacity (bbls.)	92,000	157,200	112,500	54,900	416,600	408,600
Cracking Capacity	30,700	52,600	16,200	22,700	122,200	122,200
Da. Av. Crude Runs	58,628 — 7.6	110,783 — 2.5	75,540 + 0.8	50,764 + 2.4	295,715 — 1.9	280,062
Da. Av. Other Oils	5,237 — 27.2	15,118 — 65.2	4,298 + 0.4	—205	10,848 — 31.7	16,540
GASOLINE—Gallons						
Stocks, Apr. 20	17,030,000	61,000,000	19,547,000	4,728,000	102,305,000	102,392,000
Prod. 4-20 to 4-27	8,630,000 — 8.4	17,738,000 — 5.2	8,514,000 + 2.9	4,692,000 + 1.3	39,574,000 — 3.5	38,205,000
Ship. 4-20 to 4-27	9,444,000 + 5.7	18,443,000 + 7.2	10,505,000 — 1.5	4,421,000 + 1.3	42,813,000 + 4.0	38,612,000
Stocks, Apr. 27	16,216,000 — 4.8	60,295,000 — 1.2	17,556,000 — 10.2	4,999,000 + 5.7	99,066,000 — 3.2	101,985,000
Ratio Sales to Prod.	109.4%	104.0%	123.4%	94.2%	108.2%	101.1%
KEROSENE—Gallons						
Stocks, Apr. 20	4,026,000	4,097,000	1,674,000	493,000	10,290,000	11,791.000
Prod. 4-20 to 4-27	1,666,000 — 12.7	3,008,000 — 10.3	1,558,000 + 0.6	471,000 + 95.4	6,703,000 — 4.9	6,116 000
Ship. 4-13 to 4-20	1,967,000 + 34.3	3,071,000 + 3.4	1,579,000 — 20.9	245,000 — 27.7	6,862,000 + 1.4	6,797.000
Stocks, Apr. 27	3,725,000 — 7.5	4,034,000 — 1.5	1,653,000 — 1.3	719,000 + 45.8	10,131,000 — 1.5	11,110,000
Ratio Sales to Prod.	118.1%	102 1%	101.3%	52 0%	102 4%	111 1%
STOVE DISTILLATE—Gallons						
Stocks, Apr. 20	1,445.000	2,183,000	910,000	63,000	4,601,000	5,107,000
Prod. 4-20 to 4-27	239.000 — 5.9	327,000 — 7.9	58,000 — 55.0	146,000 + 2.8	770,000 — 12.5	1,234,000
Ship. 4-20 to 4-27	378.000 + 62.2	453,000 — 26.7	309,000 + 93.1	120,000 — 28.1	1,260,000 + 7.0	1,210,000
Stocks, Apr. 27	1,306.000 — 9.6	2,057,000 — 5.8	659,000 — 27.6	89,000 + 41.3	4,111,000 — 10.6	5,131,000
Ratio Sales to Prod.	158.2%	138.5%	532.8%	82.2%	163.6%	98.1%
GAS OIL—Gallons						
Stocks, Apr. 20	6,175,000	31,185,000	4,278,000	5,343,000	46,981,000	53,364.000
Prod. 4-20 to 4-27	1,595,000 + 3.0	1,542,000 — 22.2	846,000 — 12.6	1,619,000 — 8.7	5,602,000 — 10.7	5,766,000
Ship. 4-20 to 4-27	1,265,000 + 15.0	1,858,000 — 6.3	1,216,000 — 32.1	1,541,000 — 32.1	5,880,000 — 17.7	8,533,000
Stocks, Apr. 27	6,505,000 + 5.3	30,869,000 — 1.0	3,902,000 — 8.6	5,421,000 + 1.5	46,703,000 — 0.6	50,597,000
Ratio Sales to Prod.	79.3%	120.5%	143.7%	95.2%	105.0%	148.0%
FUEL OIL—Gallons						
Stocks, Apr. 20	15,112,000	33,081,000	36,650,000	18,730,000	103,573,000	95,756,000
Prod. 4-20 to 4-27	6,442,000 — 11.5	8,374,000 + 3.7	10,158,000 — 2.8	7,317,000 + 2.9	32,289,000— 1.9	29,440.000
Ship. 4-20 to 4-27	7,744,000 + 40.9	7,781,000 + 8.3	11,837,000 — 11.1	6,190,000 — 4.8	33,552,000+ 3.2	27,948,000
Stocks, Apr. 27	13,810,000 — 8.6	33,764,000 + 1.8	34,969,000 — 4.6	19,857,000 + 6.0	102,310,000— 1.2	97,248,000
Ratio Sales to Prod.	120.2%	92.9%	116.6%	84.6%	103.9%	94.9%

Gasoline Produced by Various Methods, Week Ended April 27

	Kansas	% of Total	Oklahoma	% of Total	Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	5,730,000	66.4	13,381,000	75.4	6,447,000	75.7	2,046,000	43.6	27,604,000	69.8
Cracked	2,146,000	24.9	3,355,000	18.9	1,635,000	19.2	1,923,000	41.0	9,059,000	22.9
Natural	754,000	8.7	1,002,000	5.7	432,000	5.1	723,000	15.4	2,911,000	7.3
Total	8,630,000		17,738,000		8,514,000		4,692,000		39,574,000	

+ or — columns are % change from previous week.

Mid-Continent Stocks of All Major Products Are Lowered

Staff Special—By Telegraph
TULSA, May 1

STOCKS of all major commodities in the Mid-Continent were reduced in the last week of April, 80 refiners reported to this publication. Because of a reduction in crude runs of approximately 6000 barrels daily average and of 5000 barrels in other oils production of all commodities was reduced.

Gasoline shipments set a new high mark for this year at 42,813,000 gallons. This total is within 600,000 gallons of last year's high mark. Kansas, Oklahoma, Louisiana, and Arkansas refiners showed increases in shipments but Texas refiners failed by 160,000 gallons to equal their mark of previous week. Due to the heavy export purchases in Texas, however, shipments were over 2,000,000 gallons larger than production.

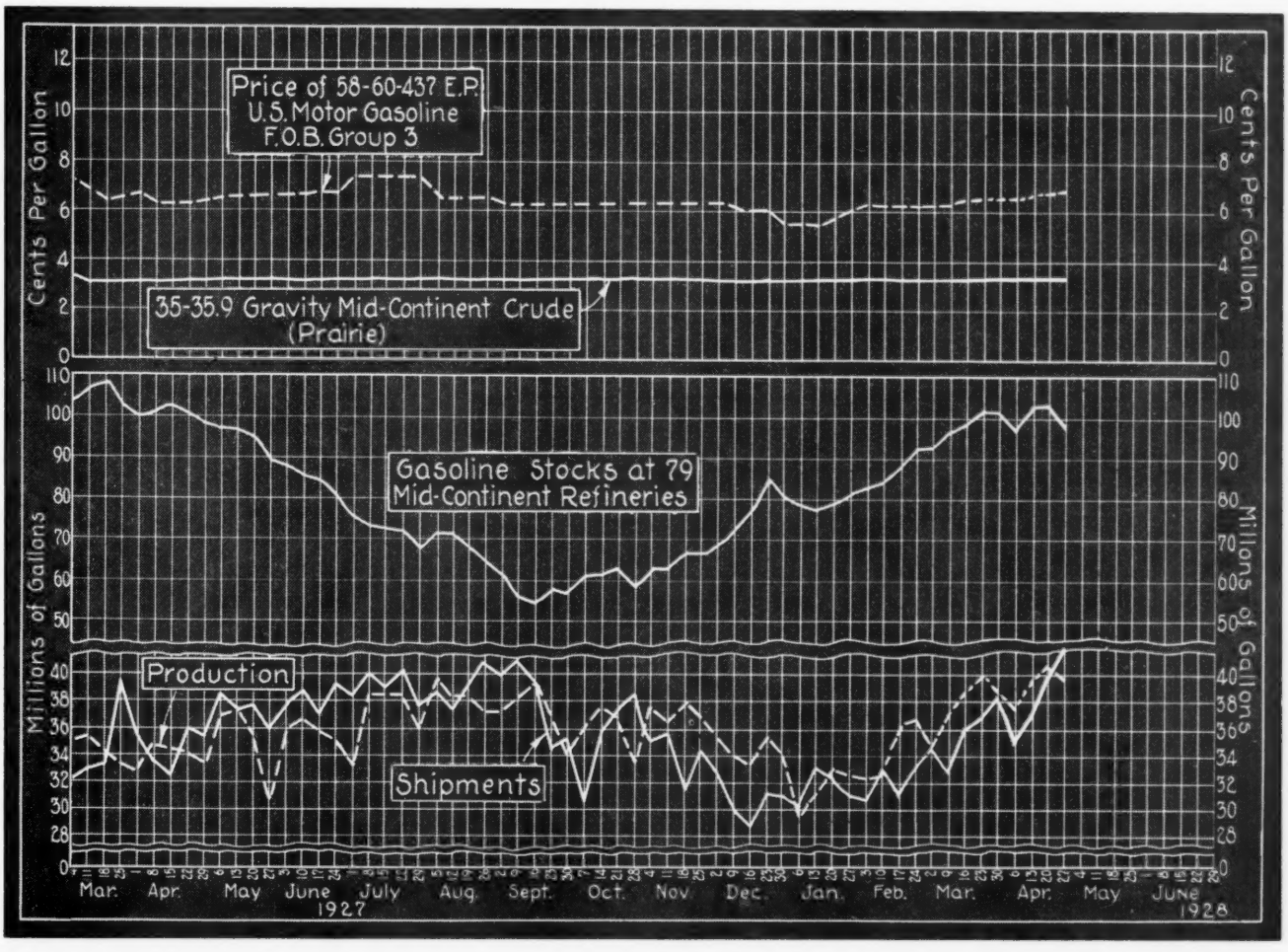
Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended April 27. Changes in stocks figured from March 30.

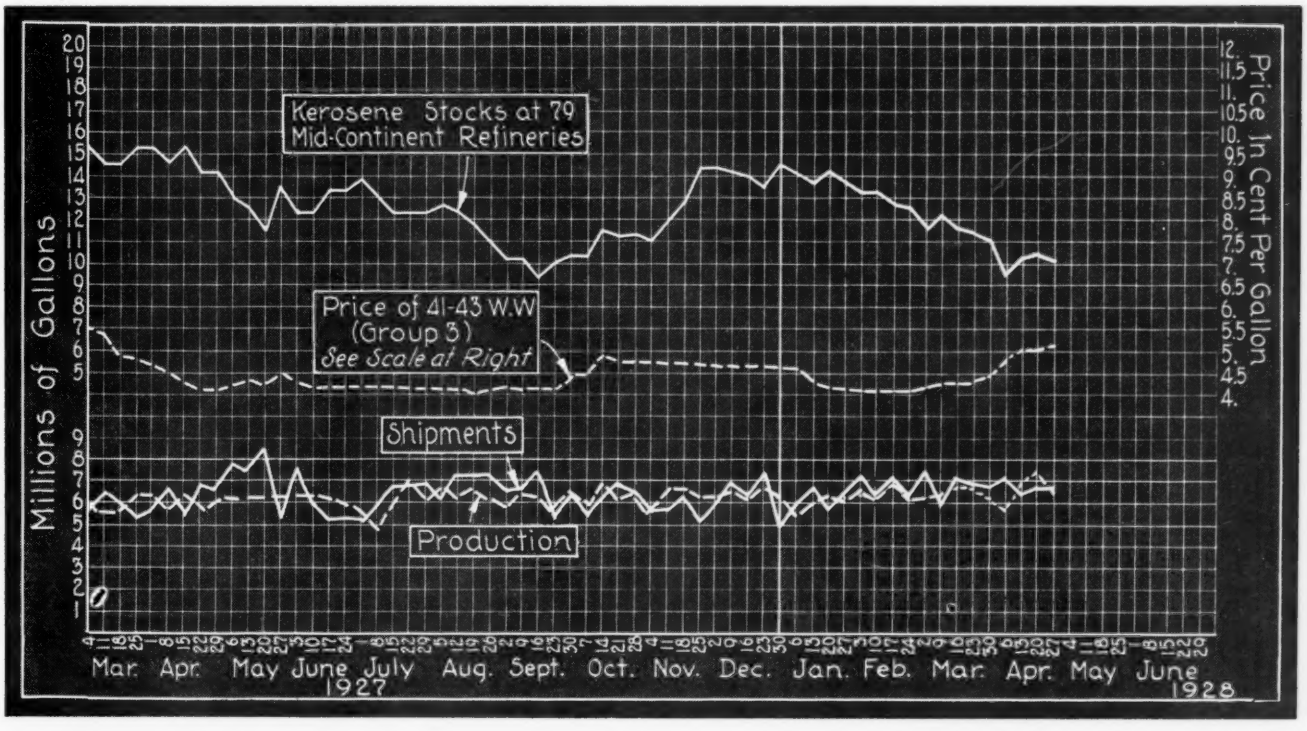
	Gallons
GASOLINE	
Production	156,527,000
Shipments	159,446,000
Net change in stocks	—2,919,000
Ratio sales to production	101.9%
KEROSENE	
Production	26,553,000
Shipments	27,532,000
Net change in stocks	—979,000
Ratio sales to production	103.7%
STOVE DISTILLATE	
Production	3,508,000
Shipments	4,528,000
Net change in stocks	—1,020,000
Ratio sales to production	129.1%
GAS OIL	
Production	26,979,000
Shipments	30,873,000
Net change in stocks	—3,894,000
Ratio sales to production	114.4%
FUEL OIL	
Production	124,583,000
Shipments	119,521,000
Net change in stocks	+5,062,000
Ratio sales to production	95.9%

Barometer of Mid-Continent Refinery Market—Week Ending April 27

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 80 Plants to National Petroleum News

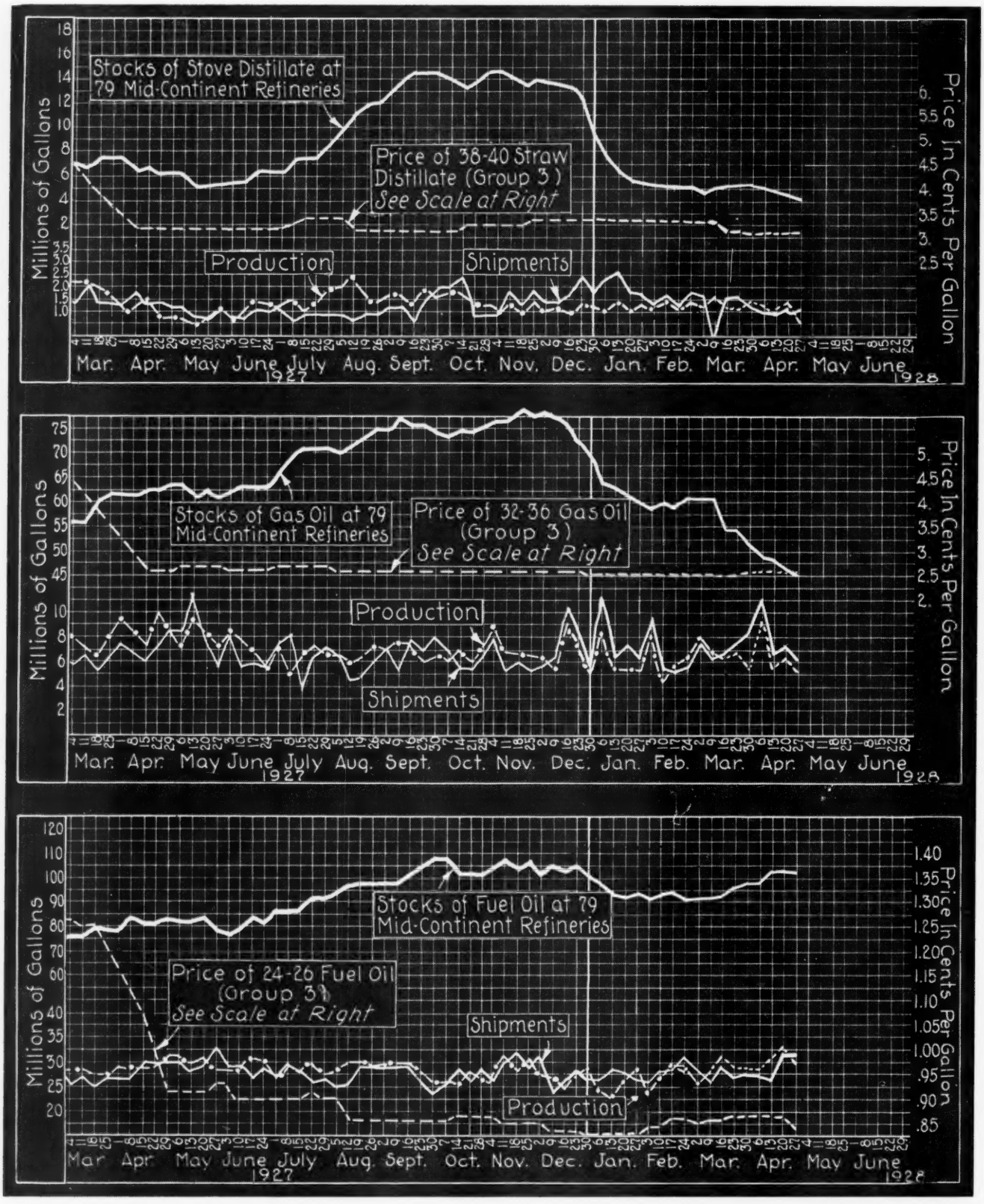

Price of 58-60-437 E.P. U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude (Prairie)
Cents Per Gallon
Gasoline Stocks at 79 Mid-Continent Refineries
Millions of Gallons
Production
Shipments
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date shown in table on opposite page

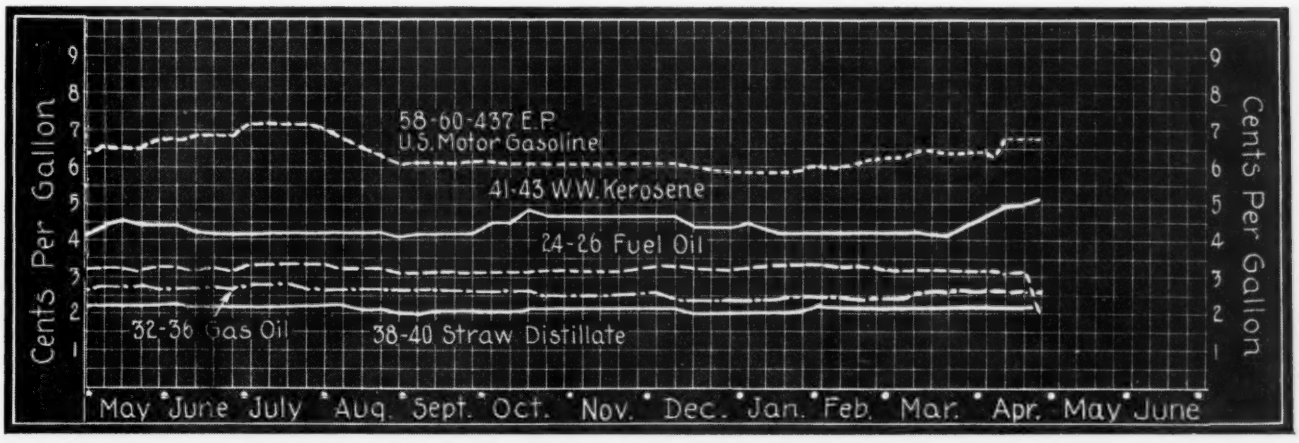

Kerosene Stocks at 79 Mid-Continent Refineries
Price of 41-43 W.W (Group 3) See Scale at Right
Millions of Gallons
Price In Cent Per Gallon
Shipments
Production
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Barometer of Mid-Continent Refinery Market—Week Ending April 27

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 80 Plants to National Petr oleum News


Stocks of Stove Distillate at 79 Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) See Scale at Right
Production
Shipments
Millions of Gallons
Price In Cents Per Gallon
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928
Stocks of Gas Oil at 79 Mid-Continent Refineries
Price of 32-36 Gas Oil (Group 3) See Scale at Right
Production
Shipments
Millions of Gallons
Price In Cents Per Gallon
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928
Stocks of Fuel Oil at 79 Mid-Continent Refineries
Price of 24-26 Fuel Oil (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price In Cents Per Gallon
Mar Apr May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Current Prices of Principal Mid-Continent Refined Products


Cents Per Gallon
58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
24-26 Fuel Oil
32-36 Gas Oil
38-40 Straw Distillate
May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June

Prices shown are on Group 3 basis and extended to date shown in Refinery Market Tables Section of this Issue

With production curtailed Kansas refiners reduced gasoline stocks approximately 800,000 gallons, Oklahoma refiners 700,000 gallons, and Texas refiners 2,000,000 gallons. Arkansas-Louisiana refiners added approximately 300,000 gallons to stocks.

Stocks of gasoline April 27 totaled 99.066,000 gallons, a reduction of 3,230,000 gallons in the week.

Gasoline stocks at the same plants April 29, 1927, totaled 101,309,000 gallons and shipments for the week ended that date totaled 36,292,000 gallons.

Kerosene shipments for the entire field were increased approximately 100,000 gallons while production was decreased 300,000 gallons. Stocks were reduced 160,000 gallons. Shipments were larger than production in all areas except Louisiana-Arkansas. Kerosene stocks a year ago totaled 14,549.000 gallons, or 4,400,000 gallons more than April 27, 1928, stocks.

Kansas refiners made the largest reduction in kerosene production with a cut of 8.4 per cent. Oklahoma refiners made a reduction of 5.2 per cent while the Texas refiners increased production 2.9 per cent and the Arkansas-Louisiana group 1.3 per cent. The Oklahoma refiners, however, had an increase shipments of 7.2 per cent while the Kansas refiners had one of 5.7 per cent. Shipments fell 1.5 per cent in Texas but increased 1.3 per cent in Arkansas-Louisiana.

Stove distillate production was cut in each field except Louisiana-Arkansas. Kansas refiners increased shipments 62.2 per cent due primarily to a cold wave in some of their territory. Oklahoma refiners' shipments were off 26.7 per cent while Texas refiners increased shipments 93.1 per cent.

Gas oil production was virtually unchanged in Kansas, was reduced 400,000 gallons in Oklahoma, 120,000 gallons in Texas and 160,000 gallons in Arkansas. Shipments were increased 15.0 per cent in Kansas but declined 6.3 per cent in Oklahoma 32.1 per cent in Texas and 32.1 per cent in Arkansas-Louisiana. Stocks for the field as a whole were reduced 280,000 gallons.

Fuel oil production declined 500,000 gallons while shipments increased 1,000,000 gallons. Stocks were reduced 1,200,000 gallons.

Crude Stocks Cut in March In California

LOS ANGELES, April 27.—Contrary to expectations, stocks of crude oil, heavier than 20° A.P.I., including all grades of fuel oil were reduced 358,708 barrels during March in California.

The new shut in movement was not effective until the first week in April and since most of the 40,000 barrels shut in during that movement was heavy oil, it is expected the April reduction of storage of this product will be considerably greater than the March figure.

During March, stocks of refinable crude were reduced 460,516 barrels to total of 20,215,802 barrels. This represents a decline of 9,285,115 barrels since March 1927.

Stocks of gasoline during March increased 532,180 barrels to total of 13,799,947 barrels. This represents a net decline of 772,045 barrels in 12 months in the state.

Daily average production of crude oil in California in March was 616,720 barrels, a decline of 5296 barrels from the previous month. These figures are taken from the monthly report compiled by the Pacific coast office of the A.P.I.

During March, 75 new rigs were built, compared with 87 in February. At the end of the month 458 wells were drilling, which is the exact number at the end of February.

Fifty-five wells were completed in March with a total flush production of 35,353 barrels. At the end of last month, 11,315 wells were on production. Twenty wildcats were abandoned as dry holes and 33 old producers were plugged and abandoned.

Weighted Average Prices Oklahoma Market

In line with National Petroleum News' new policy of carrying a weighted average price for the four more important Oklahoma gasolines in its market section, these weighted average prices, together with the number of cars of each grade sold, as of Monday, April 30, are published below. The figures are not available for publication in the refinery market table on page 122 of this issue.

	Total Cars	Weighted Average
58-60 U. S. Motor, 437 e. p.	140	6.9136
60-62, 437 e. p.	39	6.9455
60-62, 400 e. p.	17	7.0882
64-66, 375 e. p.	8	7.2188

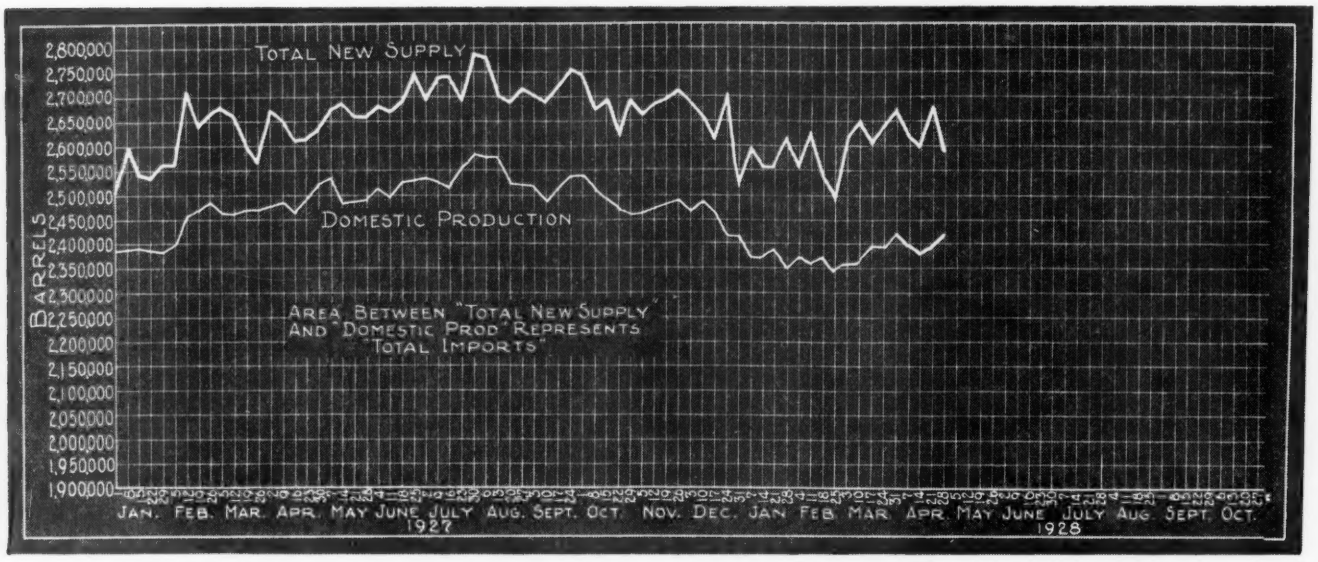
Note: Above prices are in cents per gallon, f.o.b. Oklahoma refinery, in tank car lots.

Wirt Franklin Buys Stations

TULSA, April 30.—The Wirt Franklin Petroleum Corp., Ardmore, has taken over two bulk stations and seven service stations at Edmond and Oklahoma City which were being operated by H. L. Wallis under lease from the Eason Oil Co. The former company is understood to be planning a system of retail outlets in south-central Oklahoma within short haul distance of its refinery at Ardmore.

LOS ANGELES, April 27.—F. W. Libby, managing director of Volz Engineering Co., Long Beach, is now visiting the oil fields of the east and Mid-Continent.

Daily Average Crude Oil Production and Imports



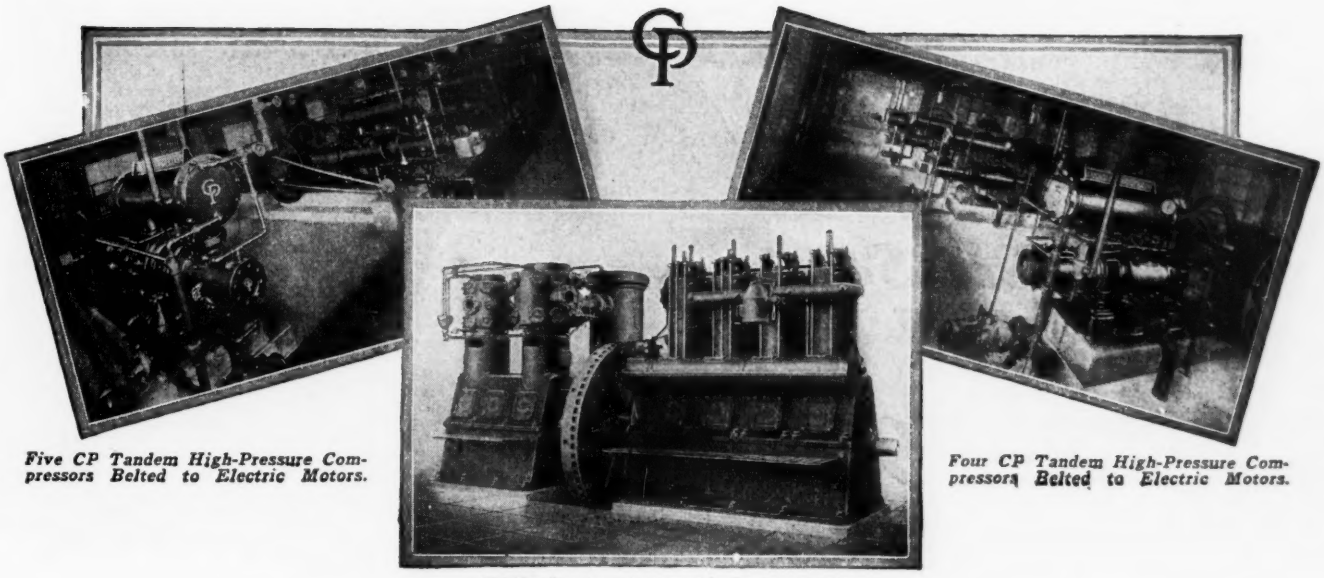
Daily average gross output of United States, by fields, for week ending with dates below as compiled by American Petroleum Institute

PRODUCTION SUMMARY

	April 28	April 21
Production east of Rockies	1,782,800	1,781,250
Increase		1,550
Total production in U. S.	2,403,800	2,393,750
Increase		10,050
Crude oil imports	190,286	285,143
Decrease		94,857
Total crude supply	2,594,086	*2,678,893
Decrease		84,807

*Revised.

OKLAHOMA	Apr. 28	Apr. 21
North Braman	2,950	2,950
South Braman	1,800	1,800
Blackwell	3,650	3,650
Hubbard	2,900	2,950
Thomas	1,450	1,450
Tonkawa	14,250	14,550
Garber	8,600	8,600
Burbank	36,700	37,750
Osage, outside Burbank	28,900	30,100
Watchorn	800	750
Cushing	20,350	20,900
Yale Jennings	9,050	8,650
Davenport	2,150	2,150
Bristow-Slick	23,950	24,300
North Okmulgee	15,500	15,500
Lyons-Deaner	6,600	7,000
Stroud	1,100	1,100
Cromwell	9,900	9,900
Papoose	4,750	4,750
Wewoka	7,700	7,650
Seminole	54,150	55,500
Bowlegs	72,250	73,350
Searight	15,150	16,350
Little River	38,450	41,750
Earlsboro	93,700	93,450
Duncan District	6,550	6,550
Graham	5,700	5,800
Fox	1,750	1,750
Healdton	14,000	14,000
Hewitt	8,650	8,650
Scholem Alechem	14,100	14,500
Others	82,150	82,450
Total, Oklahoma	609,650	620,550
Decrease		10,900
KANSAS		
Greenwood County	29,400	29,500
Florence-Covert	1,400	1,400
Peabody-Elbing	3,650	3,650
Eldorado-Towanda	14,100	14,100
Augusta-Fox-Bush	4,050	4,100
Rainbow Bend	1,650	1,650
Russell	2,900	2,900
Churchill	11,800	11,900
Oxford	17,100	16,950
Others	24,950	25,200
Total, Kansas	111,000	111,350
Decrease		350
NORTH LOUISIANA		
Homer	4,450	4,450
Haynesville	6,300	6,350
Caddo, Light	10,150	10,500
Caddo, Heavy	3,850	3,800
De Soto, Red River	4,150	4,150
Elm Grove	550	550
Bellevue	1,100	1,100
Cotton Valley, Light	3,650	4,500
Cotton Valley, Heavy	4,400	4,450
Urania	7,300	7,350
Pleasant Hill	600	550
Total, North Louisiana	46,500	47,750
Decrease		1,250
ARKANSAS		
El Dorado	5,300	5,550
Champagnolle	3,300	2,800
Smackover, light	7,150	8,150
Smackover, heavy	57,950	63,800
Stephens	1,050	1,050
Nevada	1,400	1,500
Lisbon	2,250	2,250
Others	100	100
Total, Arkansas	78,500	85,200
Decrease		6,700
TEXAS (Outside Gulf Coast)		
Panhandle District		
Hutchinson County	42,100	41,700
Carson County	7,600	7,400
Gray County	19,550	19,000
Wheeler County	1,000	950
Others	250	200
Total, Panhandle District	70,500	*69,250
Increase		1,250
North Texas		
Burkburnett	11,150	13,250
Electra	12,750	12,000
Iowa Park and K-M-A	3,200	2,000
Wilbarger	11,750	10,550
Archer County	21,000	19,000
Montague-Cooke	12,150	12,000
Others	650	650
Total, North Texas	72,650	69,450
Increase		3,200
West Central Texas		
Stephens County	8,000	7,600
Eastland-Desdemona	7,650	7,700
Brown County	12,750	12,300
Coleman County	1,700	1,900
Callahan County	3,750	3,850
Shackleford County	9,500	10,000
Young County	8,250	7,900
Throckmorton County	1,000	1,000
Palo Pinto County	450	500
Jack County	1,450	1,500
Others	750	600
Total, West Central Texas	55,250	54,850
Increase		400
West Texas		
Jones County	1,300	1,300
Mitchell and Scurry Counties	3,100	3,150
Howard County	3,850	4,000
Reagan County	18,800	19,100
Crane and Upton Counties	74,800	75,300
Crockett County	2,900	2,800
Pecos County	50,000	51,950
Winkler County	230,500	212,350
Others	1,900	1,850
Total West Texas	387,150	371,806
Increase		15,350
East Central Texas		
Mexia	7,400	7,406
Currie	500	500
Richland	500	500
Wortham	2,050	2,050
Corsicana-Powell	11,800	11,900
Nigger Creek	1,350	1,350
Total, East Central Texas	23,600	23,700
Decrease		100
Southwest Texas		
Luling	13,600	13,450
Lytton Springs	1,500	1,400
Somerset	700	700
Laredo District	6,200	6,400
Dale	1,100	1,250
Others	400	400
Total, Southwest Texas	23,500	23,600
Decrease		100
Total, Texas—(Outside Gulf Coast)	632,650	612,650
Increase		20,000
GULF COAST		
Coastal Texas		
West Columbia	8,300	9,000
Damon Mound	1,000	900
Big Creek	1,400	1,550
Boling	2,200	1,750
Blue Ridge	6,950	5,700
Pierce Junction	10,000	10,300
Humble	1,150	1,200
Goose Creek	7,300	7,200
South Liberty	3,600	4,500
Hull	10,500	11,200
Saratoga	1,100	1,100
Batson	1,450	1,450
Barber's Hill	550	600
Sour Lake	3,450	3,450
Spindletop	32,000	33,400
Orange County	4,700	4,800
Others	2,300	2,500
Total, Coastal Texas	97,950	100,600
Decrease		2,650
Coastal Louisiana		
Vinton	4,650	4,600
Lockport	4,500	4,650
Evangeline	1,150	1,100
East Hackberry	1,900	3,300
Edgerly	1,100	1,100
Others	3,100	1,700
Total, Coastal Louisiana	16,400	16,450
Decrease		50
Total Gulf Coast	114,350	117,050
Decrease		2,700
ROCKY MOUNTAIN		
Wyoming	Apr. 28	Apr. 21
Salt Creek	41,450	40,800
Grass Creek	2,500	2,600
Elk Basin	1,200	1,100
Big Muddy	2,750	2,700
Lost Soldier	5,200	4,750
Rock Creek	2,650	2,450
Lance Creek	750	750
Teapot Dome	.....	.....
Others	3,950	3,600
Total, Wyoming	60,450	58,750
Increase		1,700
Montana		
Cat Creek	1,800	1,750
Sunburst	9,500	10,000
Others	150	150
Total, Montana	11,450	11,900
Decrease		450
Colorado		
Moffat (Craig)	1,500	1,450
Fort Collins	2,950	2,800
Florence	1,250	1,250
Others	950	850
Total, Colorado	6,650	6,350
Increase		300
New Mexico		
Table Mesa	350	100
Hogback	500	500
Artesia	1,150	1,150
Rattlesnake	400	250
Others	200	200
Total New Mexico	2,600	2,200
Increase		400
Total, Rocky Mountain	81,150	79,200
Increase		1,950
CALIFORNIA		
Santa Fe Springs	37,000	37,000
Long Beach	170,000	158,500
Huntington Beach	55,500	55,500
Torrance	18,500	18,500
Dominguez	12,500	12,500
Rosecrans	6,500	6,500
Inglewood	29,000	29,500
Midway-Sunset	73,500	73,500
Ventura Avenue	49,000	51,000
Seal Beach	38,500	39,000
Others	131,000	131,000
Total California	621,000	612,500
Increase		8,500
EASTERN		
(Including Ill., Ind., Ky., O., W. Va., Pa., and N. Y.)	109,000	107,500
Increase		1,500



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Four CP Tandem High-Pressure Compressors Belted to Electric Motors.

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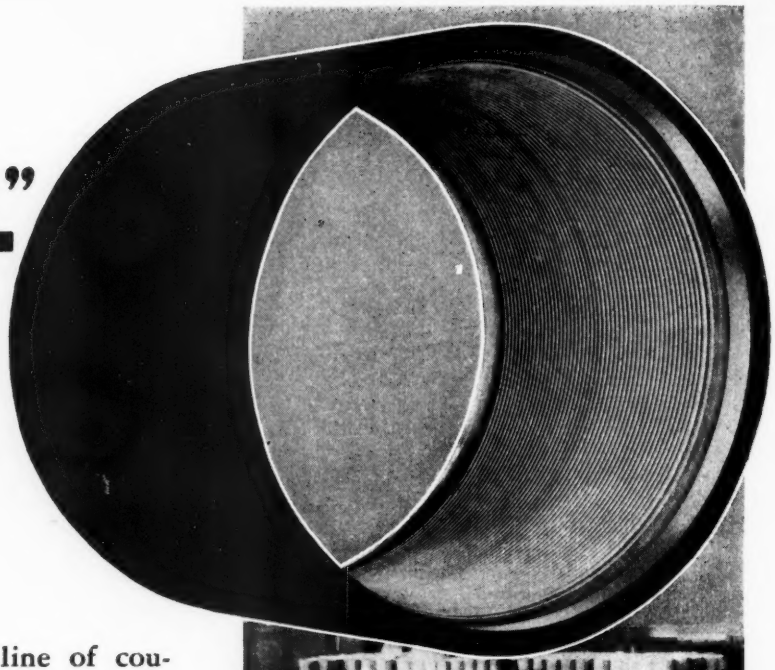

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PITTSBURGH, PA.

Good Old Gusher Days Are Back in Area South of Little River Pool

By Lawrence E. Smith
N. P. N. STAFF WRITER

TULSA, April 28

THE south Little River district of Seminole county broke forth at the end of the week and once more the talk is going the rounds that there is a chance another major pool is in the offing.

Thanks to the operators' agreement in this area, operations will be strung along for a time. It is going to take some strenuous co-operating, however, to hold it off many weeks. It is somewhat easy when there is only one well in a pool. When five or six are big producers, with different conditions governing each, the problem becomes vexatious.

It will be remembered that, early in March, a series of 10 test wells were started in T.w.p. 7-6E, Seminole county.* These were all located south of the Little River field, which is about equally located in T.w.p.s. 7-6 and 8-6. The 10 were begun by different operators but around each test there was set up an agreement. Under this the operator who drilled a well would receive $10,000 from each of his offset neighbors in case the well was dry. If it was successful, the operator was to shut it in after a three-day test, to 50 barrels per day and no offsets to it were to be started before May 15.

The latest of these tests to be completed is that of the Reiter-Foster Oil Co., in the SE NW SW of 14-7-6. Early April 28 it topped the Wilcox horizon at 4256 feet, and was drilled in one foot and started flowing over the crown block. It was reported to be out of control, hence its size was unknown.

The company has a 40-acre lease and two of the offset locations are owned by the Prairie Oil & Gas Co. and the other by Senator W. B. Pine. Under the agreement the offsets will not be started before May 1 and the Reiter-Foster well is to be pinched to 50 barrels daily until the first of the next series of wells to be started in the area is completed. That will make it sometime in July, at the earliest, before this spot is opened to production.

Earlier in the week another of the 10 test wells came in for big production. This was the Gypsy Oil Co.'s No. 1 Denmark, in the NW SW SE of 11-7-6. The Wilcox sand in this one was found at 4297 feet and was drilled three feet. It made 110 barrels the first hour and gradually increased. April 24 the full 24-hour production was 4016 barrels and on the following day 3881 barrels. It was then pinched to 50 barrels per day under the operators' agreement governing all 10 of the wells.

A week before the Gypsy well came in, the Prairie Oil & Gas Co. finished the first of the 10 wells to be completed. It was No. 1 Hudson, SW SE SE of 12-7-6. It was a failure.

The condition that led to the drilling of this series of 10 wells was the existence of two widely separated producers of large size. Snowden & McSweeney's No. 1 Tiger, NW corner of 13-7-6 and Independent Oil & Gas Co.'s No. 1 Harris, SW NW NW of 23-7-6, had been pinched into 100 barrels per day for several weeks prior to March 1.

Under this present agreement, they were opened to full production, so to continue until the first producing offset came in, when the original wells and the offset both were to be restricted to 50 barrels per day each, as well as offsets subsequently to come in. This agreement was to run concurrently with the agreement on the series of 10 test wells—until the first well of the crop to be started not earlier than May 15 comes in.

Two of the offsets to the Independent Oil & Gas Co.'s well are in. The first to be completed was the Gypsy Oil Co.'s No. 1 Conard, the news of which completion was published in the April 25 issue of NATIONAL PETROLEUM NEWS. The Gypsy's offset is due west of the Independent well. Both have been shut in to 50 barrels each.

On April 28 the second offset, The Texas Co.'s No. 1 Hotulke, directly south of the Independent's well, found the Wilcox sand at 4160 feet and was drilled to 4170 feet. It was making 200 barrels per hour as this is written and Tuesday, May 1, is the day it is scheduled to be restricted to 50 barrels per day.

No offset has yet been completed to the Snowden & McSweeney well, which is still flowing about 2000 barrels daily. The Mid-Continent Petroleum Corp. is due in with the diagonal northwest offset soon. It has been delayed by work of straightening the hole, but has a hole full of oil from the Simpson formation, immediately overlying the big pay.

Thus, the south Little River area has a promising pool centering around the northwest quarter of Sec. 23 and the northeast quarter of Sec. 22. The Reiter-Foster well extends this three-well pool better than a half mile north and east. Whether there will be continuous production from the Independent-Gypsy-Texas pool in Secs. 22 and 23 to the Snowden & McSweeney well, better than one and one-half miles northeast, is to be seen. Two tests between these wells will be completions soon.

Another meeting of Little River operators was called by Umpire Collins for May 1. At a meeting a week ago it was voted to delay starting the second crop of wells in the area covered by the agreement until June 15, extending the time 30 days. There was not a full meeting on this occasion, however, and some who were not represented have announced themselves as being opposed to extension of the time. Hence, the matter will be discussed further.

Thus, with several big wells, the Little River area claimed most of the attention. Over in the Pearson Switch area of Pottawatomie county, Continental Oil Co. brought in a Hunton lime well important because of its size. It was No. 5 Neghnquit, NE SW of 19-7-4E. Top of the Hunton was found at 3865 feet and total depth of the well is 3945 feet. It made 1875 barrels the first 18 hours and the largest 24-hour gauge was 2555 barrels. The oil is of the usual 37 gravity found in this pool.

In southern Oklahoma two wildcats which had held attention went into water. One was the Roxana Petroleum Corp.'s No. 1 Sarasota, SE corner of 13-4S-2W, two miles east of the Hewitt pool of Carter county. It had 600 feet of black oil in the hole at 3295-96 feet but drilled to 3365 feet where it got a hole full of water.

The other southern Oklahoma well was the Gilcrease Oil Co. and Mohawk Drilling Co.'s No. 1 Wolf, NE SE NE of 20-1N-2E, Murray county. It had made one flow of black oil from 1896-97 feet and showed water at 1925 feet.

In the recently opened Gorham pool of Russell county, western Kansas, Stearns & Streeter have brought in the second well. It is No. 2 Mermis, in the NW SW of 33-13S-15W. Pay was found from 3306-3309 feet and the hole filled 1500 feet with oil in 30 minutes. It is being given a swabbing test. The new well is one location north of No. 1 on the same lease, which had its pay at 3311-16 feet and made around 1000 barrels initial several weeks ago. A sizeable leasing campaign, set in motion by the No. 1 well, is still going on.

*See map, page 26, March 7 issue.

Seminole District Production by Companies and Leases, April 25 and April 18, 1928

BOWLEGS

Company	Farm	S.T.R.	April 25th Wells	April 25th Prod.	April 18th Wells	April 18th Prod.
Amerada	Rascoe	15- 8-6	8	1,775	8	1,870
Atlantic	Baker	1- 8-6	4	390	4	315
Atlantic	Fleet	23- 8-6	3	420	3	385
Atlantic	Grayson	21- 8-6	4	575	4	634
Atlantic	A. Jones	10- 8-6	3	90	3	85
Atlantic	C. Jones	9- 8-6	2	175	2	153
Total Atlantic			16	1,650	16	1,572
Barnsdall	McNac	28- 8-6	1	27	1	86
Barnsdall	Murrow	11- 8-6	4	766	4	814
Total Barnsdall			5	793	5	840
Carter	Bowlegs	15- 8-6	4	1,335	4	1,375
Carter	Burden	23- 8-6	2	260	3	255
Carter	Harjoche	15- 8-6	6	560	6	600
Carter	Hilly	23- 8-6	3	845	3	760
Carter	Jones	11- 8-6	4	1,240	4	1,285
Carter	McGeisey	21- 8-6	1	25	1	30
Carter	Mecco	9- 8-6	1	20	1	115
Carter	Melissa	9- 8-6	1	105	1	90
Carter	Walker	15- 8-6	4	565	4	595
Carter	Wise	23- 8-6	12	2,900	12	2,885
Total Carter			38	7,865	39	7,990
Empire	Lacey	15- 8-6	6	409	6	449
Empire	Wise	23- 8-6	2	330	2	325
Total Empire			8	739	8	774
Gypsy	Bowlegs	22- 8-6	1	180	1	92
Gypsy	Bradley	8- 8-6	1	0	1	2
Gypsy	Cumsey	8- 8-6	4	1,290	4	1,305
Gypsy	Dosar	7- 8-6	1	100	1	100
Gypsy	Grayson	13- 9-6	4	880	4	802
Gypsy	Harjoche	10- 8-6	2	2,697	2	2,787
Gypsy	Jones	11- 8-6	1	260	1	237
Gypsy	Walker	15- 8-6	8	1,680	8	1,782
Gypsy	Wise	23- 8-6	3	197	3	167
Total Gypsy			25	7,284	25	7,274
I. T. I. O.	Barnett	23- 8-6	2	377	2	382
I. T. I. O.	Barnett-B	24- 8-6	1	232	1	215
I. T. I. O.	Billington	22- 8-6	5	812	5	780
I. T. I. O.	Bowlegs	22- 8-6	10	1,587	10	1,730
I. T. I. O.	Davis	13- 8-6	4	1,103	4	1,092
I. T. I. O.	Fay	18- 8-6	9	1,991	9	2,039
I. T. I. O.	Goforth	15- 8-6	12	1,565	12	1,668
I. T. I. O.	Livingston	15- 8-6	10	3,551	10	3,492
I. T. I. O.	Lizzie	11- 8-6	2	377	2	414
I. T. I. O.	Walker	15- 8-6	8	898	8	915
I. T. I. O.	Wilmott	15- 8-6	4	350	4	318
I. T. I. O.	Work	23- 8-6	1	140	1	139
I. T. I. O.	Youngblood	22- 8-6	2	21	2	86
Total I. T. I. O.			70	13,002	70	13,270
Magnolia	Davis	13- 8-6	3	510	3	423
Magnolia	Davis-M	13- 8-6	1	257	1	285
Magnolia	Hammond	10- 8-6	4	1,008	3	524
Magnolia	Rhodes	10- 8-6	5	4,098	4	4,280
Magnolia	Van Buskirk	9- 8-6	1	347	1	323
Total Magnolia			14	6,220	12	5,835
McCullough	Bowlegs	22- 8-6	2	420	2	420
Mid-Continent	Baker	10- 8-6	4	1,292	4	1,355
Mid-Continent	Bowlegs	22- 8-6	1	50	1	55
Mid-Continent	Smith	12- 8-6	6	500	6	525
Total Mid-Continent			11	1,842	11	1,935
Minnehoma	Bowlegs	15- 8-6	4	274	4	315
Prairie	Gahagan	23- 8-6	4	305	4	380
Prairie	Harber	10- 8-6	8	2,785	8	3,165
Prairie	Jones	11- 8-6	4	295	4	250
Prairie	Templeton	12- 8-6	6	2,830	6	2,750
Prairie	Whitney	23- 8-6	4	425	4	515
Total Prairie			26	6,640	26	7,060
Pure	Reed	14- 8-6	15	2,643	15	2,565
Pure	Strother-D	14- 8-6	4	388	4	454
Pure	Strother-F	10- 8-6	4	1,990	4	2,092
Total Pure			23	5,021	23	5,111
Roxana	Taylor	16- 8-6	5	470	5	506
Shaffer	Lacey	14- 8-6	3	302	3	330
Sinclair	Bowlegs	22- 8-6	1	70	1	70
Sinclair	Cumsey	10- 8-6	4	3,680	4	3,719
Sinclair	Ellen	11- 8-6	7	1,182	7	1,242
Sinclair	Harjo	14- 8-6	3	565	3	650
Sinclair	Jones	8- 8-6	7	2,915	7	3,100
Sinclair	Taylor	10- 8-6	4	2,242	4	2,304
Sinclair	Taylor-W	10- 8-6	1	804	1	977
Sinclair	Walker	22- 8-6	4	1,020	4	1,007
Total Sinclair			31	12,478	31	13,069
Texas	Reed	14- 8-6	11	2,325	11	2,650
Tidal	Grayson	13- 8-6	4	680	4	715
Tidal	Harjoche	10- 8-6	6	1,255	6	1,435
Total Tidal			10	1,935	10	2,150
Twin State	Jones	10- 8-6	3	80	3	75
TOTAL BOWLEGS			313	71,107	312	73,046

LITTLE RIVER

Amerada	Nitey	2- 7-6	3	2,660	3	2,735
Amerada et al.	Fore	35- 8-6	2	710	2	770
Total Amerada			5	3,370	5	3,505
Barnsdall	Hotulke	22- 8-6	1	40	1	36
Blackwell	Nitey	35- 8-6	6	1,957	6	1,895
Carter	Fish	1- 7-6	6	1,490	6	1,560
Carter	Jackson	11- 8-6	1	705	1	725
Total Carter			7	2,195	7	2,285
Continental	Cosar	36- 8-6	4	1,990	4	2,050
Gypsy	Brown	33- 8-6	1	50	1	50
Gypsy	Canard	22- 7-6	1	52	1	3,562
Gypsy	Campbell	36- 8-6	2	235	2	247
Gypsy	Denmark	11- 7-6	1	3,881	0	0
Gypsy	Nungee	36- 8-6	1	25	1	27
Gypsy	Pottey	35- 8-6	3	347	3	315
Gypsy	Renton	11- 7-6	1	1,060	1	1,142
Total Gypsy			10	5,650	9	5,353
Independent	Harris	23- 7-6	1	50	1	2,459
Indep. et al.	Davis	2- 7-6	3	2,965	3	3,170
Total Indep.			4	2,015	4	5,629
I. T. I. O.	Campbell	1- 7-6	1	93	1	98
I. T. I. O.	Dungan	35- 8-6	3	2,276	3	2,330
I. T. I. O.	House	1- 7-6	1	247	1	221
I. T. I. O.	W-House-A	1- 7-6	1	80	1	43
I. T. I. O.	House-B	2- 7-6	4	2,539	4	2,546
I. T. I. O.	Hull	26- 8-6	1	75	1	75
I. T. I. O.	Jackson	1- 7-6	3	1,934	3	1,963
I. T. I. O.	McCulla	1- 7-6	3	827	3	862
I. T. I. O.	Nitey	2- 7-6	7	1,145	7	1,269
I. T. I. O.	Phoebe	35- 8-6	3	763	3	678
I. T. I. O.	Phoebe-B	36- 8-6	4	409	4	199
I. T. I. O.	Reed	1- 7-6	1	72	1	72
I. T. I. O.	Soketneche	1- 7-6	4	877	4	925
Total I. T. I. O.			36	11,337	36	11,281
Magnolia	Cruse	2- 7-6	3	1,585	3	1,230
Magnolia	Dixon	31- 8-6	1	0	1	21
Magnolia	Pottey	34- 8-6	3	711	4	802
Total Magnolia			7	2,296	7	2,053
Mid-Cont.	Bruner	11- 7-6	1	110	0	0
Mid-Cont.	Smith	5- 7-7	1	25	1	30
Mid-Cont.	Wadsworth	36- 8-6	7	750	7	1,000
Total Mid-Continent			9	885	8	1,030
Pine et al.	Pottey	35- 8-6	2	105	2	759
Pine W. B.	Hoyecha	26- 8-6	1	770	1	1,010
Total Pine			3	875	3	1,769
P & R	Chilcoat	25- 8-6	1	835	1	965
P & R	Dungan	36- 8-6	1	70	1	75
P & R	House	2- 7-6	4	1,615	4	1,655
Total P & R			6	2,520	6	1,195
Shaffer	Narcome	36- 8-6	1	85	1	97
Sinclair	Cosar	36- 8-6	2	1,315	2	1,365
Snowden	Tiger	13- 8-6	1	2,087	1	1,860
Superior	Soketneche	1- 7-6	1	13	1	13
Texas	Coker	1- 7-6	3	605	3	595
Tidal	House	1- 7-6	3	790	3	880
Tidal	Johnson	1- 7-6	1	75	1	75
Total Tidal			4	865	4	935
TOTAL LITTLE RIVER			110	41,100	109	44,466

EARLSBORO

Amerada	Anderson	15- 9-5	2	1,095	2	1,125
Amerada	Cowden	4- 9-5	8	1,955	8	1,845
Amerada	Rogers	3- 9-5	2	1,140	2	955
Total Amerada			12	4,190	12	3,925
Atlan. et al.	Foreman	18- 9-5	1	175	1	165
Barnsdall	Brown	10- 9-5	4	2,106	4	1,874
Barnsdall	Bruner	2- 9-5	2	950	2	760
Barnsdall	Bruner-M	11- 9-5	4	1,599	4	1,620
Barnsdall	Cudjo	11- 9-5	1	26	1	25
Barnsdall	Davis	11- 9-5	3	188	3	317
Barnsdall	Davis-J	11- 9-5	4	385	4	730
Barnsdall	Davis-M	11- 9-5	3	100	3	111
Barnsdall	Gibson	9- 9-5	8	3,697	8	3,066
Barnsdall	Hearn	15- 9-5	1	4	1	4
Barnsdall	Ingram	4- 9-5	8	2,879	8	2,287
Barnsdall	Pack	10- 9-5	4	263	4	228
Barnsdall	Peter	10- 9-5	4	136	4	305
Barnsdall	Sango	2- 9-5	5	7,920	4	6,976
Barnsdall	Sebolka	15- 9-5	1	504	1	606
Barnsdall	Sullivan	10- 9-5	3	77	3	58
Barnsdall	Watsutke	12- 9-5	4	2,114	4	1,947
Total Barnsdall			59	22,948	58	20,913
Carter	Davis	13- 9-5	2	530	2	570
Carter	Payne	12- 9-5	3	20	3	25
Carter	Sango	2- 9-5	4	1,620	4	1,925
Total Carter			9	2,170	9	2,520
Continental	Kays	2- 9-5	2	15	2	55
Continental	Spencer	12- 9-5	4	1,255	4	1,480
Total Continental			6	1,270	6	1,535
Empire	Barker	12- 9-5	1	840	1	880
Empire	Edmundston	3- 9-5	3	860	3	1,053
Total Empire			4	1,700	4	1,933
Gypsy	Bruner	10- 9-5	4	2,880	4	3,337
Gypsy	Carter	11- 9-5	9	3,290	9	3,167
Gypsy	Earl	16- 9-5	1	20	1	20
Gypsy	Hunick	5- 9-5	1	2,155	1	2,315
Gypsy	Noble	12- 9-5	4	2,927	4	3,070
Gypsy	Peter	10- 9-5	3	217	3	205

(Continued on Page 43)

Seminole District Production by Companies and Leases, April 25 and April 18, 1928

(*Continued from Page 42*)

Company	Farm	S.T.R.	April 25th Wells	April 25th Prod.	April 18th Wells	April 18th Prod.
Gypsy	Sango	1- 9-5	5	4,320	5	3,985
Gypsy	State	16- 9-5	4	1,075	4	1,112
Total Gypsy			32	16,884	32	17,211
Indep.	Bruner	10- 9-5	4	395	4	377
Indep.	Gaines	11- 9-5	4	1,015	4	1,045
Indep.	Knapp	8- 9-5	4	2,195	4	2,208
Indep.	Sullivan	10- 9-5	3	142	3	65
Total Independent			15	2,732	15	3,695
Magnolia	Bryant	9- 9-5	6	1,233	6	1,600
Magnolia	Cowden	4- 9-5	4	70	4	70
Magnolia	Edmundson	3- 9-5	3	30	3	30
Magnolia	Holmsley	11- 9-5	8	2,077	8	2,344
Magnolia	Hyde	13- 9-5	1	1,745	1	1,762
Magnolia	Ingram	10- 9-5	3	70	1	30
Magnolia	Lena	10- 9-5	3	70	3	70
Magnolia	Seay	12- 9-5	9	4,052	9	4,068
Magnolia	Simpson	10- 9-5	3	265	3	270
Magnolia	Sparks	11- 9-5	7	726	7	610
Magnolia	Sullivan	12- 9-5	3	47	3	20
Total Magnolia			48	10,346	48	10,874
Mid-Continent	McCumber	9- 9-5	7	405	7	405
Mid-Kans.	Anderson	14- 9-5	3	135	3	150
Phillips	Dunnaway	15- 9-5	1	30	1	30
Phillips	Graham	9- 9-5	3	105	4	170
Total Phillips			4	135	5	200
Prairie	Baker	23- 9-5	1	50	1	50
Prairie	Davis	13- 9-5	5	3,750	5	3,745
Prairie	Graham	3- 9-5	2	35	2	30
Prairie	Graham-O	10- 9-5	4	1,445	4	1,530
Prairie	Stidham	11- 9-5	13	4,275	13	3,490
Total Prairie			25	9,555	25	8,845
Roxana	Bayliss	17- 9-5	1	15	1	15
Roxana	Spencer	12- 9-5	2	1,617	2	1,700
Total Roxana			3	1,632	3	1,715
Shaffer	Clark	1- 9-5	5	786	5	891
Sinclair	Foreman	18- 9-5	1	15	1	15
Sinclair	Hollins	12- 9-5	2	25	2	23
Sinclair	Sango	2- 9-5	3	4,455	3	4,585
Total Sinclair			6	4,495	6	4,623
Skelly	Sherry	6- 9-6	1	150	0	0
Skelly	Spencer	12- 9-5	1	614	1	647
Superior	Walker	2- 9-5	1	232	0	0
Texas	Anderson	2- 9-5	7	795	7	855
Texas	Brown	10- 9-5	8	1,945	8	1,900
Texas	Rogers	5- 9-5	4	3,665	4	3,765
Texas	Wilmott	10- 9-5	7	1,120	7	1,182
Total Texas			26	7,525	26	7,702
Tidal	Watkins	9- 9-5	8	3,135	8	3,055
Twin State	Barker	12- 9-5	3	100	3	160
Twin State	Hearn	2- 9-5	4	2,005	4	1,182
Total Twin State			7	2,105	7	1,990
TOTAL EARLSBORO			287	94,324	285	92,939

SUMMARY

TOTAL LITTLE RIVER	**110**	**41,100**	**109**	**44,466**
TOTAL SEARIGHT	**69**	**14,594**	**70**	**16,361**
TOTAL BOWLEGS	**313**	**71,107**	**312**	**73,046**
TOTAL SEMINOLE	**307**	**54,674**	**309**	**56,288**
TOTAL SEMINOLE AREA	**1,086**	**275,799**	**1,085**	**283,100**
Average per well		**254**		**261**

Completions in Oklahoma and Kansas, Week Ended April 28, 1928

OKLAHOMA

Caddo County

Company	Well No.	Location	Depth	Init. Prod.
Caddo	1	SWc NW NE 5-5-9 W	1950-1958	35

Carter County

Company	Well No.	Location	Depth	Init. Prod.
Magnolia	1	SWc NW NE 11-2-3 W	4655-4665	40
Magnolia	2	SEc NW SW 23-1-3 W	2461-2760	75

Creek County

Company	Well No.	Location	Depth	Init. Prod.
Pennsy	3	CWL NE NE 18-17-7 E	2992	Dry
Murray	1	SWc 8-19-9 E	T.D. 2989	Dry
Gled	1	NEc SW NW 17-18-9 E	T.D. 3455	Dry
Short et al.	1	NEc SE NW 15-18-12 E	T.D. 2225	Dry
Jackson et al.	3	SWc NW 13-17-10 E	T.D. 1889	Dry

Grady County

Company	Well No.	Location	Depth	Init. Prod.
Gypsy	6	SEc SW NW 16-3-5 W	T.D. 2595	Dry
Meridian	1	SWc NE SE 23-5-8 W	T.D. 2060	25M
Kipp et al.	3	SEc NW 35-5-8 W	2035-2340	25M
Magnolia	6	SWc NW NE 35-5-8	2022-2379	25M
Commerce	1	NEc NW SW 13-4-8	2222-2365	25M
Carter	4	NEc NW SE 21-3-5 W	1759-1765	250

Kay County

Company	Well No.	Location	Depth	Init. Prod.
Goins et al.	1	CWL E½ SW NW 7-28-1 E	755-770	.8M
Farmers	1	NWc SW 14-28-1 W	T.D. 890	Dry
Argabright	1	CEL NW NW 11-27-1 W	T.D. 665	Dry
Wentz	1	NEc SE NE 7-27-2 E	T.D. 554	Dry
Blackwell	2	C SE NE 29-25-1 W	T.D. 1500	Dry

Muskogee County

Company	Well No.	Location	Depth	Init. Prod.
Pine et al.	1	NWc NE NW 9-15-15 E	T.D. 1727	Dry
Slusher et al.	1	CWL SW NW 6-14-17 E	T.D. 1783	Dry
Metzger et al.	7	NWc SW NE SE 6-14-19	T.D. 828	Dry
Trelkeld et al.	1	SWc NW NW SW 6-14-19	T.D. 893	Dry
Butler	1	CEL SE SW NW 6-14-19	T.D. 780	Dry
Ark-Add	4	CSL SE NE SW 6-14-19	514-535	40
Lovelace	1	CSL SE NE SW 6-14-19	514-525	90
Ragland et al.	2	SWc SE NE SW 6-14-19	508-528	30
Walters	1	SEc NE SW 6-14-19	514-528	40
Olean	1	C SE NE SW 6-14-19	514-526	40
Sioux	2	NEc SE SE 14-13-18	T.D. 555	3M
Boyle et al.	6	CNL NE SE 8-15-15	1621-1623	125
Bryan-Emery	1	CSL SE NE 8-15-15		150

Okfuskee County

Company	Well No.	Location	Depth	Init. Prod.
Future Dev.	1	C NW SE 20-10-9 E	T.D. 3100	7M
Schermerhorn	1	C SE NW 20-10-9	3070-3181	4M
Robinson	2	NEc SW 35-11-9	1466-1476	15
Edgewood et al.	1	NWc 5-13-10	T.D. 3512	Dry

Okmulgee County

Company	Well No.	Location	Depth	Init. Prod.
Morgan	2	CNL NE SW 14-11-13	T.D. 1570	Dry
Hazlett et al.	5	NWc NE NW 33-13-13	1376-1493	13M
Wallace	8	NWc NE SE 14-14-14	1703-1742	12

Osage County

Company	Well No.	Location	Depth	Init. Prod.
Duffield	4	NWc SW NW 35-29-10	1700-1760	7
Phillips	8	SEc NW SE 17-27-6	2905-2970	600
Phillips	9	NEc SW SE 17-27-6	2892-2865	300
Kewanee	12	NEc SW NW 34-27-6	2862-2925	14
Prairie	5	CSL NW 21-27-6	2867-2935	755

Payne County

Company	Well No.	Location	Depth	Init. Prod.
Pure	2	SWc NE SE 7-18-4	T.D. 4458	Dry

Pontotoc County

Company	Well No.	Location	Depth	Init. Prod.
Homaokla	8	NWc NE SW 17-5-8 E	T.D. 2880	Dry
Bowles et al.	1	SWc SE 35-4-6 E	T.D. 1415	Dry
Westheimer	1	SEc 8-5-8 E	T.D. 2460	OWD 310
Hughes	1	SEc NW 15-4-7	1107-1110	3M

Pottawatomie County

Company	Well No.	Location	Depth	Init. Prod.
Continental	4	SEc NE NW 19-7-4	3766-3850	205
Pierce	1	NWc SW 20-7-4	3740-4068	100

Seminole County

Company	Well No.	Location	Depth	Init. Prod.
Shaffer	7	NWc SW SE 1-9-5	4373-4398	197
Texas	8	NEc NW SE 2-9-5	4374-4382	495
Magnolia	1	NWcSE NW 13-9-5	4414-4420	2085
Carter	1	SEc SE NE 9-8-6	4154-4179	145
Sinclair	5	NWc SE SE 9-8-6	4532-4534	75
Carter	1	NWc NE NW 18-6-8	4178-4181	85
Mid-Continent	3	C E½ NE NW SE 7-5-8	2456-2498	78
Mid-Continent	9	SEc NW SE 7-5-8	2460-2475	750
Texas	1	SWc SE NW SW 8-5-8	2347-2391	519
Texas	2	SWc NW SW 8-5-8	2396-2408	369
Prairie	1	NWc SW SW 5-9-6	4220-3235	30
Twin State	6	SWc NE NE 12-9-5	4383-T.D.	Dry
Tidal	3	SWc NE SW 10-8-6	T.D. 4730	Dry
Crosbie	2	SWc NE SW 15-8-8	T.D. 3297	Dry
Prairie	3	SWc SE 34-8-6	T.D. 4890	Dry

Stephens County

Company	Well No.	Location	Depth	Init. Prod.
Schermerhorn et al.	1	NEc NW SE 11-1-4 W	T.D. 3506	Dry
Mudge	7	NEc SE SE NW 23-1-5 W	640-646	4
Scott et al.	1	NEc SW NW 19-2-7 W	1471-1476	7½M
Schermerhorn et al.	3	NWc NE SW 13-1-4 W	2754-3761	390
Skelly	6	SWc SE 13-1-4 W	2596-2772	686
Franklin	7	NEc NW NE 23-1-4 W	2545-3256	950

Tulsa County

Company	Well No.	Location	Depth	Init. Prod.
Glidden	2	SWc NE NE 15-19-11	1675-1703	30
Holmes et al.	1	NWc SW 20-19-10	T.D. 3202	Dry

Wagoner County

Company	Well No.	Location	Depth	Init. Prod.
Robinson et al.	1	NWc SW 21-19-16	T.D. 565	Dry
Boyd et al.	3	CNL SW NW 7-18-15	T.D. 1323	Dry
Scriba	4	SEc NW NW SW 30-17-18	T.D. 620	Dry
Goyd et al.	4	CEL SW NW 7-18-15	1287-1294	5

KANSAS

Butler County

Company	Well No.	Location	Depth	Init. Prod.
Cress et al.	1	NEc 26-27-5	T.D. 3171	Dry

Chautauqua County

Company	Well No.	Location	Depth	Init. Prod.
Manhattan	1	SEc NW NW 33-32-9 E	T.D. 2651	Dry

Clark County

Company	Well No.	Location	Depth	Init. Prod.
Walker et al.	1	SWc NE 16-31-23 W	T.D. 450	Dry

Cowley County

Company	Well No.	Location	Depth	Init. Prod.
Durham-Work	1	NWc SE 19-31-3	T.D. 2275	Dry
Roth-Faurot	1	C SE 18-31-5 T	T.D. 717	Dry
Prairie	1	SEc SW 10-32-4	T.D. 3322	Dry
Lewis	1	SEc SW SE 30-31-6	2908-2970	25
Trees	1	SEc NW 12-32-6	2473-2491	2M

Elk County

Company	Well No.	Location	Depth	Init. Prod.
Phoenix	4	NEc NW NW NW 23-30-10 E	1895-2004	35
Truby et al.	1	SEc NE SE 25-30-10	1581-1593	30
LaDow et al.	1	NEc SE SW 21-29-12 W	T.D. 1730	Dry
Pennock	1	NEc SW 36-30-10	T.D. 1890	Dry
Harvey et al.	1	SWc NW 21-30-11	T.D. 1575	Dry
Union Gas	23	C NE NW 14-31-10	T.D. 1992	OWD Dry

Greenwood County

Company	Well No.	Location	Depth	Init. Prod.
Darby	7	NEc SW SW 24-22-12	1628-1683	200
Empire	4	SWc NE NE 26-22-12	1643-1684	150
Darby	10	CSL NE SE NW 30-22-13 E	1696-1739	400
Skelly	1	NWc SE NE 32-22-13	1796-1829	30
Murphy et al.	2	NWc SW SW SE 6-25-9 E	2087-2129	150
Mohawk	2	NEc SW NW 7-27-11	1877-1887	150
McCullough	2	CWL SW SW 10-25-13	T.D. 1695	Dry
Stark et al.	1	NEc 1-25-10	T.D. 2034	Dry

Marion County

Company	Well No.	Location	Depth	Init. Prod.
Reynolds et al.	1	NEc NW NE NE 22-17-14	2392-2435	200
Phillips	4	SEc SW NW 23-17-4	2341-2410	150

Sumner County

Company	Well No.	Location	Depth	Init. Prod.
Roxana	1	NEc SW SW 14-32-2	2010-2104	390
Barnsdall et al.	5	NEc NW NW 23-32-2	2032-2125	975
Barnsdall et al.	7	CWL NW NW 23-32-2	2100-2155	900

Woodson County

Company	Well No.	Location	Depth	Init. Prod.
Fees et al.	1	SEc SW 4-24-16	T.D. 1505	Dry
So. Kans.	1	SWc 8-23-17 E T	T.D 1480	Dry

Completions in N. E. Central, West, Panhandle and North Texas, Week Ended April 28, 1928

NORTH EAST CENTRAL

Brown County

Company	Well No. Farm	Location Survey	Depth	Init. Prod.
Richards	6-Curry	Betts	1104-1114	40
Henshaw	7-Bush	Kenney	1089-1099	225
Bush et al	1-DA	Gragg	1661-1686	3
Spence et al	1-Jacobs	Ken Co.	1527-1550	10
Amerada	1-Graham	Brown	T.D. 1257	Dry
Scrivnor et al	1-Windham	Byrd	T.D. 1450	Dry
Cranfill et al	2-B-Hill	Mudgett	T.D. 1502	Dry
Cranfill et al	2-Newton	Honeycutt	T.D. 1143	Dry
Buffalo	3-Perry	Kenney	T.D. 1110	Dry
Wentz et al	1-Keller	Kenney	T.D. 1250	Dry

Callahan County

Ames	1-Johnson	Johnson	T.D. 656	Dry
Falryn	1-Jackson	BBB&C	T.D. 1029	Dry
Kingwood	1-Berry	BBB&C	T.D. 1504	Dry
Davis et al	1-Harris	Harlow	T.D. 2815	Dry
Bemas et al	2-Jackson	BBB&C	893-898	2M

Coleman County

Midwest et al	2-Morris	Schaffer	T.D. 2310	1.7M
Roth-Faurot	2-Stevens	Coleman	1067-2068	2¼M
Smith	1-Hill	Sprogue	1840-1844	10
Ehem et al	1-Beck	ACH&B	T.D. 2485	Dry
Syndicate et al	1-Hunter	Fowler	T.D. 2018	Dry

Eastland County

Lone Star	2-Anderson	Senze	T.D. 3500	Dry
Adamson et al	1-Nones	H&TC	T.D. 1173	Dry
Andrews	1-Pippin	TE&L	T.D. 368	Dry
Gulf	2-Horn	McLennan	1596-1599	130
Gholson	1-Jones	Mathis	3390-3418	195
Lone Star	1-Anderson	Sonza	2350-3081	2¼M

Jack County

Security	8-Cullers	Cullers	1985-1954	50

McCulloch County

Dobbs et al	1-Deakins	Kage	T.D. 1800	Dry

Shackleford County

Callahan	2-Nail	ET	T.D. 1493	Dry
Tannehill	1-Matthews	ET	1134-1162	830
Tannehill	2-Matthews	ET	1144-1149	165
Harris et al	1-Matthews	ET	1021-1030	15
Amerada	1-Alex.	TP	1639-1650	20

Smith County

Humble	1-Lassiter	Herring	T.D. 890	Dry

NORTH TEXAS

Archer County

Cullum	2-Nankins	SP	655-672	8
Bridwell	2-Wilson	Geraldine	1573-1585	70
Golke et al	4-Wilson	Geraldine	1556-1563	65
Johnson et al	5-Wilson	Geraldine	1556-1565	145
Panhandle et al	2-Garvey	TEL	746-762	12
Rose	1-Garvey	TEL	742-762	40
Kelleher et al	1-Garvey	Harris	T.D. 1550	Dry
Wright et al	4-Wilson	Scott	T.D. 1334	Dry
Hines	1-Anderson	Rainey	T.D. 1038	Dry
Humble et al	1-Crawford	Holman	T.D. 1353	Dry

Cooke County

Green	1-Campbell	BBB&C	T.D. 1924	Dry
McElreath	1-Whaley	SAMG	T.D. 2330	Dry

Wichita County

Clark et al	1-Munger	KWVFL	T.D. 1808	Dry
Bridwell et al	1-Womack	GCSF	1316-1329	24

Wilbarger County

McLaughlin	1-Guyer	Waggoner	T.D. 2012	Dry

N. Young County

WoMax	1-Farmer	GB&N	T.D. 800	Dry
Hawthorne	1-Tucker	TEL	T.D. 1200	Dry
Willis et al	1-Sparks	TEL	T.D. 752	Dry
Myers	2-Johnson	Sargent	T.D. 694	Dry
Kleiner et al	1-Rowley	TEL	T.D. 608	Dry
Parker et al	1-Holt	Blakley	T.D. 600	Dry
Pennell et al	5-Boone	BBB&C	490-515	7
Allday	8-McKinley	TEL	812-833	12
Riggs et al	4-McKinley	TEL	488-511	40

PANHANDLE

Armstrong County

United Eight	1-Rick	H&GN	T.D. 3780	Dry

Dallas County

Dalhart	1-James	H&TC	T.D. 2865	Dry
Wood et al	1-Capitol	H&GN	T.D. 4504	Dry

Gray County

Texas	4-Bowers	H&GN	2560-2580	55&6M
Texas	2-Chapman	H&GN	2818-2832	279

WEST TEXAS

Fisher County

Cranfill et al	1-Young	BBB&C	3106-3129	160

Howard County

Goodley	3-Hooks	W&NW	1820-1847	25

Menaru County

Smith	1-Kothman	Sec 269	T.D. 450	Dry

Pecos County

Kirby	1-Univ.	Univ. 36	T.D. 1356	Dry
Oregon	1-Yates	I&GN	T.D. 1430	Dry
Mid-Kans et al	1-Yates	I&GN	1192-1379	1300

Completions in North Louisiana and Arkansas, Week Ended April 26, 1928

Louisiana—Bossier Parish—Cartersville

Company	Well	Location	Depth	Yield
Magnolia Pet. Co.	Matlock No. 1	25-23-12	3075	33M gas
Texas Company	H. Rose M. & M. Co No. 2	21-23-11	3075	35M gas

Webster Parish—Cotton Valley

Magnolia Pet. Co.	Cole No. 1	27-21-10	4729	5M gas

DeSoto Parish—Naborton

Williams et al	Fortson No. 1	4-12-11	765	3M gas

Ouachita Parish

Hatcher & Evans	Hatcher No. 7	21-19-4E	2208	4M gas
Pioneer Oil & Gas Co.	Filihiol No. 2	11-18-4E	2228	4M gas

Richland Parish

Company	Well	Location	Depth	Yield
W. C. Feasel	Duff No. 1	21-16-6E	2440	54M gas
Ruston Drilling Co.	Mulhern No. 1	19-16-6E	2445	49M gas

East Texas—Panola County

D. Thomason	Crenshaw No. 5	B. C. Jordan HRS	985	4M gas

Arkansas—Smackover

Little Fay Oil Co.	Robertson No. 6	25-15-16	2067	50 bbls.

Rainbow City—Union County

Magna Prod. Co.	Dumas No. 1	11-17-14	3240	950 bbls.

Drilling Operations in Oklahoma, Kansas and Texas, Week Ended April 28, 1928

	April 28 Loc.	Rigs	Drg.	S.D.	Week Ended Total	April 21 Loc.	Rigs	Drg.	S.D.	Total
OKLAHOMA										
Burbank	..	4	15	..	19	..	8	14	..	22
Other Osage	2	14	14	1	31	5	12	7	1	25
Bristow-Cushing	5	5	32	11	53	4	5	30	9	48
North Oklahoma	8	5	53	45	111	8	8	52	44	112
South Oklahoma	9	6	100	14	129	9	8	101	16	134
Muskogee	..	8	64	17	89	..	10	60	19	89
Okmulgee-Bristow	12	30	74	24	140	12	23	73	27	135
Seminole Dist	24	22	176	23	245	25	25	190	21	261
Total Oklahoma	60	94	528	135	817	63	99	527	137	826

	April 28 Loc.	Rigs	Drg.	S.D.	Week Ended Total	April 21 Loc.	Rigs	Drg.	S.D.	Total
KANSAS	37	60	144	60	301	34	69	142	59	304
TEXAS										
Central	..	86	227	189	502	..	83	232	177	492
Panhandle	..	68	87	77	232	..	67	78	83	228
N. Central	..	63	111	24	198	..	70	88	24	182
West	..	101	180	167	448	..	93	168	181	442
Laredo	..	1	25	19	45	..	1	25	19	45
Total Texas	..	319	630	476	1,425	..	314	591	484	1,389
New Mexico	..	10	16	26	52	..	8	17	27	52
GRAND TOTAL	97	483	1,318	697	2,595	97	490	1,277	707	2,571

New Field Operations in Oklahoma, Kansas, Panhandle, North, North Central and West Texas, Week Ended April 28, 1928

OKLAHOMA

Caddo County

Company	Well No. Farm	Location
Caddo	3-Cutshall	NWc NE SE 5-5-9 W

Carter County

Sinclair et al	2-Morris	SEc NE 29-2-3 W
Humble	4-Ratliff	NWc NE SW 20-1-3 W

Creek County

Pensey	3-Cain	CWL NE NE 18-17-7 E
Wilson et al	1-McNac	NEc SW 25-17-8 E
McMann	1-Samples	NEc SE NE 35-20-8 E
Shock	1-Harjo	NEc NW NE 26-14-10 E
Tibbens	1-Carmen	SWc NW 29-15-9
Tibbens	1-Tiger	SWc SE 27-15-8 E
Markham	6-Beesley	SEc NW 20-17-7 E
Stebbens	1-Mosquito	NWc SW NE 36-19-9
Holmes et al	1-Halsey	NEc SE 28-19-9

Grady County

Commerce Dev	2-Parks	NWc SW SW 13-4-8 W
Commerce Dev	2-Pond	SEc NW SW 13-4-8 W
Okla. Utilities	3-Woods	SEc NE NW 2-4-8 W
Carter	6-McCaughtry	NWc NE NW NW 26-5-8 W

Jefferson County

Skelly	3-Ryan	NEc SE SE 23-6-6 W

Kay County

Leonard et al	1-Buesing	CWL NE SW 20-27-1 E
Martin et al	2-Buesing	C NW NW 9-27-1 E
Carter et al	1-Johnson	C SE NE 18-29-1 E
McDorman et al	1-Campbell	SEc SW 32-29-1 W

Muskogee County

Tillman	2-Jackson	NWc NE SW 8-14-19 E
Routt et al	1-Kelly	SWc NE NW 8-14-19 E
Hillcrest	1-Kell	C NE NE NW 7-14-19 E
Staley et al	3-McDaniel	CWL NW SE SE 6-14-19 E
Olean	2-Lot-36, Blk-16	C SE NE SW 6-14-19 E
Crippy et al	1-Cobb	NEc NW SW 6-14-19 E
Becker et al	2-Kelley	CEL NW SE NE 5-14-19 E
Dewell et al	1-Ballard	SEc SW 3-14-19 E
Evans et al	1-Thompson	SWc NW SW 2-14-19 E OWD
Barbre et al	1-Drake	C NW NE 12-14-18 E
Tautenhahn	1-Callahan	SEc NE SE 3-14-18
Shaffer et al	1-Robison	SEc SE 36-15-18 E
Jolly Ogg	1-Serrell	NEc SE NE 21-15-15 E OWD

Okmulgee County

Misener	1-Colbert	SEc NW 14-14-14 E
Hazlett et al	3-Fields	CWL NW NE 33-13-13 E
Transcontinental	1-Pteres	CNL NW SE 34-16-14
Nourse et al	1-Rowe	SEc NE NW 20-15-14 E
Wheeler	1-Throckmorton	NEc NW 32-15-13 E

Osage County

Peters et al	1-	NWc SE 32-24-9
I. T. I. O	5-	SWc NW NW 36-25-9
Link	1-	CNL SE 34-25-9
Leahy et al	1-	NWc NE NE SE 9-25-9
Knupp	7-	CWL E½ W½ SW 36-27-11

Pawnee County

Grives et al	1-Blackmer	NEc SE NE 22-20-9
Adamson	1-	NWc SE SE NW 25-21-8 E
Wallace et al	3-Weeks	NWc NE NE SE 30-20-9

Pottawatomie County

Superior	1-Cloude	SWc NW NW 24-7-4 E OWD

Seminole County

Sinclair	1-Nakoche	NEc SW 18-5-8 E
Ramsey	5-Culley	NWc SW SW NE 18-5-8 E
Twin State	1-Love	SWc SE 25-8-6 E
Sinclair	6-Yarbrough	NEc NW NE 4-10-8 E OWD

Stephens County

Magnolia	1-Wright	SEc NW SE 36-1-4 W
Magnolia	1-Helvy	NEc NW NW 24-1-4 W
Humble	4-Peddycoart	SWc NE NE 25-1-4 W
Pace et al	1-Pennington	NWc SW NE 18-2-7 W
Maer-Stanforth	1-Bond	SWc SE 7-2-7 W
Amer. Pipe Line	2-Bond	SWc NW SW 7-2-7 W
Franklin	1-McMasters	NEc NW NE NE 13-2-8 W
Franklin	4-Fobb	SEc NE SE 12-2-8 W
Winkler et al	1-Hite	SWc NE 35-1-8 W
Magnolia	5-Burke	NWc NE NW NE 34-1-8 W
Carter	1-Burke	NWc SE SE 34-1-8 W
Fisher et al	1-Nelson	NWc SE NE 28-1-8 W
Clark-Cowden	1-Williams	NEc NW SE 31-1-8 W
Brannon et al	2-Funk	SEc SW SE 19-1-8 W

Tillman County

Everts et al	1-Indian	SWc NW NE 11-5-13 W

Tulsa County

Nowata	4-Bedray	SWc NE SE 30-19-12
Glidden	4-Johnson	CNL SW NE 15-19-11

Wagoner County

Crosbie et al	4-Grayson	NEc SE 15-16-14
Brophy-Lumel	1-Gibson	NEc NW NW 17-16-15 E

KANSAS

Butler County

Empire et al	1-Robinson	SEc NE 29-25-4 E
Empire	1-Brandenberger	NEc SW NE 22-27-5 E

Chautauqua County

Griffeth-Bell et al	5-Oliver	SEc NE NW 1-32-10 E

Cowley County

Cameron et al	1-Wise	SEc SW 30-31-3 E
Trees	2-Hittle	SEc NE 21-31-4 E
Manhattan	1-King	SWc NW 22-31-4 E
McCullough et al	1-King	NWc SW 22-31-4 E
Elmwood	1-Enme	NEc NW 14-32-3 E

Elk County

Union	14-Chaffine	SWc 14-31-10 E

Greenwood County

Darby	8-Frankhouser	NWc SE SW 24-22-12 E
Simmons-Rhodes	3-Schwab	NWc NE SE 30-22-13 E
Hubbard et al	2-Freeman	SWc SE 6-24-11 E
Cross et al	1-Scott	NEc NW 18-24-12 E
Lassen et al	1-Gregg	SWc NE 6-25-9 E

Lyon County

Empire	1-Lewis	SEc SW NE 18-21-10 E

Marion County

Company	Well No. Farm	Location
Phillips	1-Sklenar	NEc NW SW 23-17-4 E
Gilliland	1-Sklenar	NWc NE SW 23-17-4 E
Sinclair	1-Hayes	SEc NW 26-17-4 E
Phillips	1-Thompson	NWc SE SE 26-17-4 E
White Eagle et al	1-Meyer	NEc SW 26-17-4 E
Davis et al	1-Rampel	SWc NW 7-19-3 E

Sumner County

Palmer et al	2-Weinrich	NWc NE NW 23-32-2 E

Woodson County

Big Indian	1-Gardner	SEc NW 27-23-17 E
La Dow et al	1-Settlemeyer	NWc NE SE 25-26-14 E

TEXAS
NORTH AND NORTH CENTRAL

Archer County

			Survey
Humble	1-Hamilton	Sec-6, Abstract-1266	BBB&C
Killeher et al	1-Garvey	Sec-55	Harris
Bridwell	3-Wilson	Blk-12	Geraldine
Burton	1-Parrish	Sec-2, Abstract-1021	SP
Consolidated	4-Kinder	Sec-54, Blk-5	Clark et al
Consolidated	2-Lyles	Sec-3	Probert et al
Johnson	6-Wilson	Blk-19	Geraldine
Panhandle	1-Farmer	Blk-8	Anderson
Panhandle et al	3-Garvey	Sec-1856	TE&L
Pelvin	1-Chancellor	Abstract-1110	Rucker
Petroleum Prod	3-Wilson	Blk-13	Geraldine
Petroleum Prod	4-Wilson	Blk-13	Geraldine
Sun	19-Farmer	....	Bell Co. Sch. Land

Brown County

King et al	1-King	Blk-147	Deadrich
Pandem	9-Hutton	Blk-4	Nobles
Pandem	10-Hutton	Blk-4	Nobles
Shuler et al	2-Boyson	Blk-4	Williams
Baker et al	2-Cross	Blk-624	Kenney
Sinclair et al	1-Hines	Blk-647	Eldridge
Daniels et al	1-Mier	Blk-3	SA&MG
Peckham et al	4-Bush	Blk-624	Kenney
Jay Hawk	6-Boyson	....	Williams
Phillips	12-Hickman	Blk-783	Benson
Fulcher et al	1-Selvidge	Sec-32	H&TB
Henshaw	9-Bush	Blk-624	Kenney
Henshaw	10-Bush	Blk-624	Kenney
Henshaw	11-Bush	Blk-624	Kenney
Humble	10-Kilgore	Blk-789, Sec-3	Delgando
Humble	5-Kilgore	Sec-3, Blk-789	Delgando

Callahan County

Armstrong et al	1-Ables	Sec-32	D&DA
Farlyn	1-Snider	Sec-140	BBB&C
Flynn et al	1-Kelly	Sec-2281	TE&L
Swoveland et al	2-Shackelford	Sec-14	D&DA

Coleman County

Mid Sun	2-Guthrie	Blk-77	Lipscomb
Fletcher Green	1-Dibsell	Sec-11	HT&B
Magnolia	20-Morris	Blk-728	Breeding

Cooke County

Stoneman	1-Field et al	Abstract-904	Stanley
Oil Operators Trust	9-Kleiss	Blk-2	Littleton

Eastland County

Amerada	1-Roberts	....	Puckett
Andrews	1-Peppin	Sec-3167	TE&L
Barkley et al	4-Duffer	Sec-13	McLennon Co. Sch. Ld.
Teatsorth et al	2-Holcomb	Sec-1, Blk-4	H&TC

Shackleford County

Phillips et al	1-Davis	Sec-19, Blk-13	T&P
Sentinel	1-Elliott	Sec-63	LWL
Skelly	1-Mathews	Sec-33	ET
Tannehill	2-Mathews	Sec-27	ET
Treat	3-Mathews	Sec-33	ET
Treat	2-Mathews	Sec-33	ET
Tannehill	2-Mathews	Sec-33	ET
Donohue et al	3-Mathews	Sec-28	ET
Donohue et al	2-Mathews	Sec-28	ET

Stephens County

Mid Tex	2-Morrison	Sec-1209	TE&L

Wichita County

Lomax Bros	3-Ethenelge et al	....	Palo Pinto Co., Sch. Land

Wilbarger County

Barkely et al	4-Waggoner	Sec-24, Blk-4	H&TC
Fain-McGaha	1-Waggoner	Sec-51, Blk-4	H&TC
Towers-McKana	1-Waggoner	Sec-32, Blk-4	H&TC
Phillips	8-Waggoner	Sec-45, Blk-4	H&TC
Kolp	1-Waggoner	Sec-8, Blk-4	H&TC
Golding et al	1-Waggoner	Sec-24, Blk-4	H&TC
Golding et al	1-Waggoner	Sec-33, Blk-4	H&TC
Kimmell	1-Conn	Sec-26, Blk-13	H&TC

Young County

Bron et al	1-Edwards	Sec-1499	TE&L
Gynne	1-Kimbrell	Blk-4, Abstract-1838	BBB&C
Kerbow et al	1-Baden	Abstract-252	Sallie
Panhandle et al	3-Pitman	Abstract-1484	Mathews
Panhandle	1-Hawkins	Sec-1914	TE&L
Pennell et al	5-Boone	Abstract-34	BBB&C
Shappell	8-Johnson	Abstract-253	Sargent
Shappell	9-Johnson	Abstract-253	Sargent
Allday	4-Johnson	Sec-15	Sargent
Kleiner et al	1-Rowley	Sec-1915	TE&L
Weekly	1-Robinson	Sec-1406	TE&L
Willis et al	1-Sparks	Sec-286	TE&L
Bowen	1-Brooks	Sec-637	TE&L
Clarrida et al	1-Clarrida	Abstract-1697	Nicholson
Cooper et al	1-Hutchings	Sec-230	TE&L
Gutewood et al	1-Rodgers	Sec-288	TE&L
Jitters et al	1-Garvey	Sec-1857	TE&L
Riggs et al	5-McKinley	Sec-1489	TE&L
Shaw-Riggs	4-McKinley	Sec-1489	TE&L
Steed et al	1-Donald	Sec-291	TE&L

(Continued on Page 46)

New Field Operations in Oklahoma, Kansas, Panhandle, North, North Central and West Texas, Week Ended April 28, 1928

(Continued from Page 45)

WEST TEXAS AND PANHANDLE

Crockett County

Company	Well No. Farm	Location	Survey
Transcontinental...	1-Atwood	NWc Sec-7, Blk-PP	TC

Garza County

Lattimer et al.....	1-Cook	SWc Sec-13, Blk-4	Aycock

Gray County

Magnolia.....	2-Bowers	SE SW NW Sec-63, Blk-B-2	H&GN
Operators.....	3-Jackson	NE NW NE Sec-88, Blk-B-2	H&GN
Parton et al.....	1-Morse	NWc NE Sec-5, Blk-26	H&GN
Magnolia.....	1-Eakins	SWc NW Sec-56, Blk-25	H&GN
Danciger.....	1-Webb	NWc Sec-62, Blk-25	H&GN
Travis et al.....	1-Chapman	SWc Sec-10, Blk-26	H&GN

Hutchinson County

Phillips.....	14-Gibson et al.	Sec-63, Blk-46	H&TC
Phillips.....	5-Dorsett et al.	Sec-64, Blk-46	H&TC
Phillips.....	6-Dorsett et al.	Sec-64, Blk-46	H&TC
Oil Operators Trust	2-Sanford et al.	Sec-82, Blk-46	H&TC

Irion County

Kimbrough et al...	1-Nutt	SEc SW NW Sec-5	Gonzales Co. Sch. Land

Motley County

Exploration.....	4-Matador Land et al.	C SE Sec-21, Blk-D-2	WT

Pecos County

Mid-Kansas et al..	19-Yates	Sec-34½, Blk-1	I&GN
Roxana.....	1-Smith	Sec-24, Blk-194	TC
MidKiansas.....	18-Yates	Sec-34½, Blk-1	I&GN
Mid-Kansas et al...	15-Smith et al.	Sec-33, Blk-194	TC

Schleicher County

Long-Long.....	1-Williams	NEc Sec-28	HE&WT

Ward County

Denver Prod.....	1-Cherokee Land Dev.	Sec-215, Blk-34	H&TC
Rector.....	1-State	Sec-30, Blk-4	H&TC

Wheeler County

Edwards et al.....	1-Trostle	C NE SE Sec-130, Blk-23	H&GN

Winkler County

Humble.....	4-Hendricks	SEc NE Sec-32, Blk-26	PSL
Atlantic et al.....	5-Hendricks	SE SW NW Sec-40, Blk-26	PSL
Atlantic et al.....	6-Hendricks	SW SE NW Sec-40, Blk-26	PSL
Southern Crude....	5-Hendricks	SW SE SE Sec-33, Blk-26	PSL
Atlantic.....	5-Hendricks	NEc Sec-41, Blk-B-5	PSL
Atlantic.....	1-Lemar	SWc NW Sec-46, Blk-26	PSL
Gulf Prod.....	16-Hendricks	NWc Sec-40, Blk-B-5	PSL
Gulf Prod.....	17-Hendricks	SEc NE Sec-45, Blk-26	PSL
Independent.....	7-Vardeman	NEc NW Sec-41, Blk-B-5	PSL
Pure Oil.....	2-Hendricks	SWc SE Sec-45, Blk-26	PSL
Pure.....	3-Hendricks	SEc Sec-45, Blk-26	PSL
Pure.....	4-Hendricks	NEc SE Sec-45, Blk-26	PSL
Republic Prod.....	7-Hendricks	SW SE SW Sec-45, Blk-26	PSL
Roxana.....	1-Lemar	SWc Sec-46, Blk-26	PSL
Roxana.....	2-Hendricks	NW NW SW Sec-46, Blk-26	PSL
Atlantic.....	8-Hendricks	SWc NW Sec-29, Blk-B-5	PSL
Landreath Prod....	7-Hendricks	NWc SW Sec-29, Blk-B-5	PSL

Deep Sand Completions Boost Long Beach Production

LOS ANGELES, April 28

ALTHOUGH Potrero and Rincon are occupying some attention in oil circles in California, Long Beach is easily in the spotlight on account of its numerous deep sand completions and consistent production increase each week.

Many predict that the production peak will be between 200,000 and 225,000 barrels daily, to be reached in four or five weeks.

During the past week, eight wells were placed on production at Long Beach. Seven had an average flush production of 1990 barrels daily, while one workover had a flush of 1300 barrels. All were drilled into the deeper sand. April 28, 78 deep zone wells had a total production of about 100,000 barrels. This does not include production from the old wells in the field.

Ten new locations were reported last week and early in the week 230 holes were drilling for the deep sand. One outstanding recent development was the completion of a well in the southeast part of Long Beach for 1100 barrels at 6320 feet. It had been thought that new wells would have very small production in the deep zone in this part. This well throws open new territory, heretofore little thought of.

General Petroleum Corp. last week completed Hisey 2 at Ventura Avenue for 600 barrels at 7276 feet, hanging up the record for the deepest commercial producer in the world. This record was held by Associated Oil Co. in same field for about two weeks. Production of this deep well fell to about 450 barrels a few days after completion, a lot of drill pipe having been dropped in the hole.

Associated Oil Co.'s Lloyd 100 this week had reached total depth of 7501 feet and should be tested the coming week, probably bringing back the world record to Associated. None of the holes so far have found the bottom of the sand. Forty wells are drilling in the field, with 15 locations and 8 rigs.

Twenty-five wells are drilling at Rincon, the new field in Ventura County, with 7 wells on production producing a daily average rate of about 270 barrels. The shallow oil zone is a disappointment, but it is indicated the zone around 3300 feet, already proven, will be more productive.

Chanslor-Canfield-Midway Oil Co.'s B-1 on top of the hill, almost a mile from the producing wells on the beach, which blew in recently, sanded up and is being worked over. The well blew in when a small shot was placed at 4230 feet to jar loose the smaller casing. The well started flowing clean oil. This well had been giving a lot of trouble for more than a year, as every effort to shut off water had failed.

Seal Beach is showing a steady decline in production as little active drilling is going on. The town lot area in the Alamitos Heights end of the field has been drilled up and the three large companies controlling the older end of the field are not drilling below the Selover sand. Huntington Beach is very quiet, with few wells drilling. New wells are not being completed fast enough to offset natural declines in the field. The same can be said of Inglewood, where a deeper sand has been proven but held for later development.

Oil Reserve Lease Probe To Take In Salt Creek

(By Telegraph)

WASHINGTON, April 30.—Without debate or roll call the senate today ordered an investigation of Salt Creek oil leases. It also ordered continuation of the Teapot Dome and Elk Hills reserve lease inquiry, $40,000 being appropriated for that purpose. The public lands committee, which is better known as the Teapot Dome committee, is to handle the work.

This may be regarded as the Democratic appendix to the Teapot Dome investigation. The inquiry that has been going on for four years has been devoted to activities under the Harding administration. The resolution offered by Senator Norris, of Nebraska, is a recognition of the charge by Senator Robinson, of Indiana, Republican, that leases in Salt Creek field made by the Wilson administration were obtained by fraud, inquiry into which was stopped, according to the story by A. Mitchell Palmer, when he was attorney general.

Chairman Nye, progressive Republican, expects to begin work on the Salt Creek phase in the fall, perhaps in time for the campaign orator's benefit. Senator Robinson alleged the leases gave the Midwest interests practically a monopoly in Salt Creek. The resolution directs the committee to report whether the leases could or should be annulled or cancelled.

New Potrero Field Fills Last Gap In Beverly-Newport Fault

By Wm. E. Green
N. P. N. STAFF WRITER

LOS ANGELES, April 28

POTRERO is the name of the new oil field in Los Angeles county. It was proven as a producing field last October by a well making a small amount of oil, but secured a real place on the maps of Los Angeles Basin when Associated Oil Co.'s Cypress 2 came in April 11 for an average of 1000 barrels per day. It was permitted to produce three days and was then killed to await storage.

No. 1 Cypress was the first hole to produce oil, and this well staged a gas blowout this week, turning attention to the field anew.

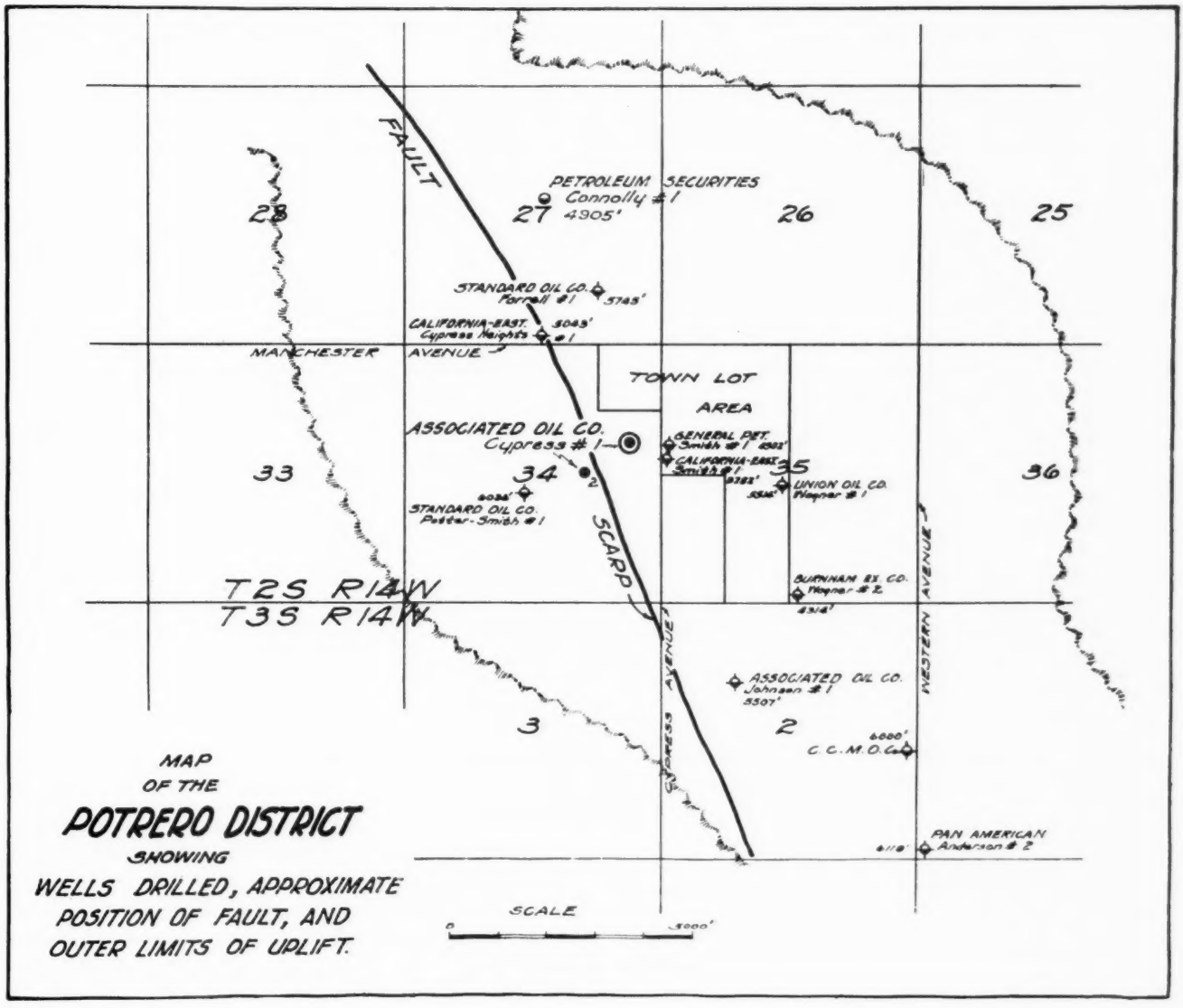
The new field fills the last remaining gap of any consequence along the Beverly-Newport fault, sometimes called the Palms to Newport uplift. Reference to the accompanying map shows the Los Angeles Basin fields on this fault line.

The new Potrero field is about midway between Inglewood and Rosecrans, and is just outside of the city limits of Los Angeles. Associated Oil Co. holds under lease and in fee 520 acres well blocked in this area.

A number of tests have been drilled in the past ten months north and east of the Associated holdings, and one dry hole to the west and two to the south, but some distance from the discovery well. Last October it was estimated that at least $5,000,000 had been spent up to that time in exploration work in the general area in 1927, to say nothing of cost of dry holes drilled the previous three or four years.

No. 2 Cypress was placed on production April 11 and started flowing at the rate of 1000 barrels of 47.5 gravity oil, with a cut of 2.3 per cent. It was turned into the tanks just before noon April 12 and, the first day, produced 1049 barrels of 47.2 gravity oil, cut 2.9 per cent, with a tubing pressure of 110 to 300 pounds, while the casing pressure ranged from 500 to 680 pounds. The second day it produced 947 barrels of oil ranging from 43.4 to 47.9 gravity, cut 5 per cent. Pressures remained fairly level.

Third day's production was 965 barrels of 45.7 to 48.2 gravity oil with a cut of 4 per cent. Tubing



pressure had dropped to a range of 90 to 275 pounds, while the casing pressure ranged from 480 to 750 pounds. It made about 1,250,000 cubic feet of gas daily. The well was killed at noon April 15 to await storage.

Four 5000-barrel steel tanks are being erected, and, as soon as these tanks are ready, the well will again be placed on production. Bottom of the hole is 4619 feet, with string of 9-inch casing cemented at 4421 feet, giving the well 198 feet of pay formation. Following is the casing record of the well: 15½-inch at 997 feet, 9-inch at 4421 feet, with 3-inch tubing to 3994 feet. It therefore came in bare-footed, without screen or perforated pipe of any kind.

The high gravity of the oil is slightly disturbing, due to the fact that never in California has any well, producing oil higher than 40 gravity held up over a period. Oil from No. 2 Cypress has a gasoline content of 74.52 per cent, with 0.33 per cent sulfur. The gas had a natural gasoline content of 3.2 gallons. It is expected that the well will be placed on regular production by April 30.

When No. 1 Cypress was placed on production last October bottom of hole was at 4705 feet, at which time it made 150 barrels of 38.6 gravity oil, in addition to about 5,000,000 cubic feet of gas. Since that time this hole had been drilled to 5408 feet and string of 4¾-inch cemented at 5283 feet.

No. 1 Cypress blew out as the 4¾-inch was being pulled, as the pipe had gone bad at 4632 feet. All the pipe was out of the hole except 1200 feet when the blowout came. It made about 15,000,000 cubic feet of gas, with some mud, water and a slight trace of oil. By April 27 fittings had been placed and it will be closed in to permit more work in the hole. The casing record of this hole was: 15½-inch at 1000 feet, 11-inch at 3793 feet, 8⅝-inch at 4383 feet, 6¼-inch at 4590 feet and 4¾-inch at 5283 feet. Three-inch liner had been placed to bottom at 5408 feet.

At the San Francisco meeting of the American Association of Petroleum Geologists in March a paper presented by Joseph Jensen and Glenn D. Robertson on "Developments in Southern California Since 1923," discussed the Potrero area as follows:

"Map 1 shows how fully the Palms-to-Newport uplift has been proven the seat of oil fields and that, with the exception of the Potrero district, every uplift has now been proven to represent an oil field. Two faults are associated with this uplift. The upthrown side of the one on the northeast side of the Inglewood Field is the northeast block. The downthrown side of the one in the vicinity of the Seal Beach field is also the northeast block.

"The fact that faulting had an important bearing on developments in the Inglewood field has already been emphasized. That it might have a bearing on the next uplift to the southeast was sensed about two years ago. This led to renewed prospecting in the Potrero district.

"Map 2 shows the wells that have been drilled in the Potrero district, as well as the approximate position of the fault scarp. Thus far gas has been found in two wells, both of which lie east of the fault—the one being Standard's Farrell No. 1, in Sec. 27, and the other California Eastern's Smith No. 1, in Sec. 35. Oil-bearing formation has been found in Associated's Cypress No. 1, in Sec. 34, from 4383 to 5408 feet. Such production as has come from the well is oil from 37° to 40° gravity, and this well has produced as much as 130 barrels of clean oil per day.

"Associated's Cypress No. 2 is also drilling in Sec. 34. It has found the same shallower oil showings at approximately the same depths below sea level as Cypress No. 1, but it has not yet reached the zones from which Cypress No. 1 produced (March 1). In this district oil showings have, therefore, been proven through a vertical thickness of about 1000 feet and they have been proven horizontally about 900 feet.

"The character of oil and the formations secured in the Potrero district indicate, that if a field is found, it will be very similar to the Rosecrans field. Experience in the development of that field has indicated the sort of problems that may be expected in further work in the Potrero district."

The paper was read before the geologists of the country with the express permission of J. A. Taff, chief geologist of the Associated Oil Co., and for that reason the reference to the Potrero field can be classed as an official expression from the company, discoverer of the new field.

The completion of the producing oil well and the presence of so much gas in the older hole indicates the presence of a field at least well worth developing and promises that a number of holes will be drilled by the Associated later this year and in 1929. Some leasing has been going on and at least three or four tests will be drilled by other concerns.

Recovery in Muskegon Field Declining

CHICAGO, April 28.—Oil companies scouting the shallow oil field near Muskegon, Mich., report that recent developments indicate more strongly than ever that the field will not develop a bonanza. In the last two weeks the number of dry holes increased to eight and the daily recovery from the field has declined slightly.

Although the Muskegon field once yielded 1100 barrels a day for a short while, it is now giving up only about 500 barrels. The discovery well drilled by the Muskegon Oil [illegible], on the Charles Reeths farm [illegible] Sec. 9-10-16, which came in for 340 barrels, is now doing about 30 barrels. It is reported the company is cleaning out and preparing for a deep test.

Most of the early developments in the locality are expected southeast of the present development, a region not yet thoroughly tested.

2000-Barrel Wildcat 8 Miles from Luling

(By Telegraph)

HOUSTON, April 30.—A 2000-barrel discovery well has opened a new area for development northeast of the Luling field and southeast of Lytton Springs development in Caldwell county, central south Texas.

The well, which was completed April 28 by Dr. James Bute and associates on the Branyon tract five miles southeast of the town of Lockhart, made 100 barrels the first hour at total depth of 2243 feet.

The oil tests 34.9 gravity and is believed to be coming from the Eagle ford shale formation. The Luling field, about 8 miles from the Bute discovery, produces from a fault structure in the Edwards limestone. The Lytton Springs field yields its production from serpentine beds associated with a volcanic plug which formed a reservoir for migrated oil from other source rocks.

Luling production is found at a depth similar to the Bute well but comes from a deeper stratigraphic horizon. The Lytton Springs pay is shallower both as regards drilling depths and stratigraphic position.

Active trading in the Bute-Branyon area followed the first showing of oil found in the new well last week. This was intensified after final completion April 28. The Sun, Texas, Humble and Dixie companies all own acreage in the surrounding area. Many leaseholds, however, have been held for a number of years and their terms will require prompt drilling.

Skirmishing for tracts belonging to small interests in the area resulted when the new well's real worth was established by final completion. After making 100 barrels the first hour the well showed a tendency to increase its flow and the control head was pinched. In that condition it still tested 100 barrels the second hour. It was then pinched to 20 barrels an hour and made 335 barrels from 12:20 to 6 p.m. April 28.

The Flashing System

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Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

The Editors' Viewpoint

National Petroleum News

Selling the Public the Industry

THE oil industry really has two things to sell: one, its products, and the other, itself as an investment. In far too many cases has oil company advertising concentrated solely on the products and overlooked entirely giving the public worthwhile information which would help the industry in its investment.

True, satisfied customers of petroleum products should mean a satisfied investment, but that doesn't always follow.

Legitimate oil companies do not have to wander up and down the street crying their stock issues like the shysters, but nevertheless, the higher the standing in the public's estimation of an oil company, the easier it will be to sell its stock, the easier the terms will be that the oil company can make with the bankers and brokers, and the more that stock will be held and appreciated by the public as an investment.

Henry L. Doherty, who always has stayed pretty close to the run-of-mine people of this country, has always sold his company's customers as investors. In this year's advertising of the company, both in national mediums and in newspapers, not only the Cities Service petroleum products are emphasized, but also the investment desirability. The two classes of advertising are run together so that the satisfied automobile owner will have every reason to tie up with that satisfaction the investment possibilities of the company.

Cities Service also emphasizes the fact that it is its own largest customer of gasoline and oil, a recommendation which carries considerable weight.

All this leads to a better understanding by the public of the oil industry.—W. C. P.

These Dealers Won't Be Missed

HOT-DOG joints thrive on gasoline price wars. It seems ridiculous to say any kind of business benefits from a price war but developments on the west shore of Michigan in the last few weeks indicate, if not quite prove, this to be true.

A devastating gasoline price war embracing Muskegon on the west and Grand Rapids on the east, came to an end a few weeks ago. Now the wayside hamburger and soft drink stands are taking out their pumps and, in some cases, they are closing entirely.

Up in Michigan, when a filling station closes for the winter the management wraps the pumps in burlap and locks the doors until the next season. Such stations are easily distinguishable from those that are going out of business and junking their equipment.

Just now the stations that were closed for the winter are opening, driveways are being cleaned and painting is in progress. The profitable season is at hand. But the hot-dog joints are going out of business any way because they can't compete in a sound market.

The west Michigan price war was more than a year old. Its fame had spread all over the state among that legion of traveling salesmen and motorists who cover the state regularly. They all knew where the cheap gasoline was, and if they were coming into that zone from the east or south they waited until they got there to fill their tanks.

This brought a great deal of business into the cut price region—unprofitable business though it was. Jobbers in other towns lost the gallonage but the oil men in the price war zone who maintained their prices, did not get any of it. It went to the pump at the wayside hamburger stand, probably at a loss to the oil man. Only the retailer enjoyed a profit.

Now the war is over. The cheap gasoline zone is no more. The gravy is all gone for the transient motorist. The oil men in the immediate neighborhood may benefit to some extent but those in more distant towns benefit more. Now they serve the business cars that once were driven by their stations hunting a cheap fill. —W. K. H.

Continuous Service is Recognized

CONTINUOUS service with an oil company is coming to be looked upon more and more as worthy of special recognition. The dollars and cents value of service is measured with reasonable accuracy by the pay check. Beyond that, however, a satisfaction comes from long associations and the knowledge of mutual appreciation. Service emblems are concrete evidences of appreciation. The fact that they are so recognized is causing their use to grow in large corporations.—P.W.

Must Become Market Conscious

HOW relatively little restraint the petroleum industry would have had to exercise in 1927 to hold production of crude within the limits of demand is pointed out in an article in the February issue of The Lamp. The Lamp is the official publication of the Standard Oil Co. (New Jersey).

This article, entitled "Changing Aspects of Production," points out that the amount of crude that went into storage in 1927 was about 64,087,000 barrels, or 6.4 per cent of total production and imports of crude and its equivalents.

"If every producer and importer of crude oil had only produced or imported 93.6 barrels for every 100 barrels he did produce or import, there would have been no disturbing margin," the article reads.

"Were that decreased activity spread over all the producing states and applied likewise to imports from other countries, the disruption within the industry would be inconsequential and would be amply compensated for by the subsequent stability and security which a balanced ledger of supply and demand would secure."

This emphasizes what this publication has pointed out many times. The oil industry must become market conscious. Individuals and companies who carry on its operations must realize there is a place in consumption for every barrel of crude before it is taken from the ground, or refined or placed in distribution channels.—V. B. G.

'Dixie Gas' Movement, Born in Michigan, Spreads Through Wisconsin

Staff Special

CHICAGO, April 28

"'DIXIE GAS,' the Power to Pass"; a trade slogan well known throughout the southern Michigan peninsula, will be almost as conspicuous on the west side of Lake Michigan by May 1.

Dixie Distributors, Inc., of Wisconsin has been organized and territories have been assigned that completely cover the east half of the state from north to south.

The Wisconsin organization already embraces 22 members and 29 bulk plants. The books are being kept closed for a few days pending the decision of a few jobbers who are described as being "on the fence." After that the complete list of charter members will be made public. Officers and directors of the new group are as follows:

E. Bert Rentmeester, Oconomowoc Oil Co., Oconomowoc, is president; Gray Czeskleba, Czeskleba Oil Co., Waupaca, is vice president; Sam D. Hastings, Jr., Barkhausen Oil Co., Green Bay, is secretary and treasurer. The two additional directors are A. G. Anderson, Wausau Oil Co., Wausau, and Cliff J. O'Connor, O'Connor Oil Corp., Fond du Lac.

The 22 members whose money already is in the treasury of the Dixie Distributors, Inc., of Wisconsin, and whose names are on the contract to conduct their business according to standards set up by the organization, sold aggregately about 20 millions of gallons of gasoline last year, according to the state's official gasoline inspection report.

All the officers previously mentioned, after incorporating their organization under the laws of Wisconsin, arranged for a meeting in Chicago on April 17 at the Congress hotel. Several officers and directors of the Dixie Distributors, Inc., of Michigan met with them, including L. V. White of the L. V. White Co., Kalamazoo, and J. J. Theisen of the Theisen-Clemens Oil Co., St. Joseph.

While they were in Chicago the Wisconsin officers spent a good part of their time being interviewed by salesmen. They arranged a plan whereby they expect to spend $20,000 in 1928 for newspaper and poster advertising. They decided upon a uniform color scheme of white, yellow and blue and bought paint enough to cover the service stations, pumps and trucks of all the members. They also bought pump globes and some other advertising media and practical equipment.

E. BERT RENTMEESTER
Oconomowoc Oil Co., Oconomowoc, Wis., president of the newly organized Dixie Distributors, Inc., of Wisconsin

The Wisconsin group will function in much the same way as the Michigan organization has for about two years. It is simply an exclusive organization of oil jobbers banded together for collecting, marketing, and for collective buying to a certain degree. Each jobber has exclusive right to a certain territory and the use of the association's benefits therein.

"Dixie" is the trade name for the products marketed by the members of the organization. "'Dixie Gas,' the Power to Pass," is the slogan used on all the association's advertising. The same color scheme prevails throughout Michigan and Wisconsin. The germ of the idea originated with L. V. White of Kalamazoo, Mich., and the rhymed slogan was exclusively his until three years ago.

Grimes & Madigan, oil jobbing firm of Grand Rapids, was second to adopt it. The company was younger than that of L. V. White and the management saw the advertising and liked it. The two companies' territories were contiguous but did not overlap and Mr. White saw the advantage of giving his advertising wider scope. Both jobbers profited by the arrangement and the fame of it spread. Now there are 25 Michigan jobbers in the organization and they marketed 40 millions of gallons of gasoline in 1927.

The organization in Michigan is headed by L. V. White of Kalamazoo, president. J. J. Theisen of St. Joseph is vice president; F. S. Grimes of Grimes & Madigan, Grand Rapids, is treasurer, and Paul Kempf of the Staebler Oil Co., Ann Arbor, secretary. Other directors include Carl Westlund, Cardinal Petroleum Co., Muskegon; L. H. Cole of the Cole Oil Co., Pontiac, and Judson Lewis of the Lewis Oil Co., Hillsdale.

The board of directors meets monthly to take care of purchases of specialties of all kinds and things the members need in the conduct of their business. The organization provided a collective buying department, but using it is not obligatory. The members may use it whenever it is to their advantage to do so but they may buy everything they use and sell individually if they prefer.

To join in the Dixie movement a jobber must be able to cover a certain prescribed territory fully, having enough distribution in it to serve the demand that is likely to develop there. The initiation fee is $100 per company and members must also pay into the organization $3 a car for gasoline sold under the Dixie brand. The money is used entirely for advertising purposes and Michigan now is fairly well covered with 7 x 14-foot billboards.

"Dixie Gas" must be of U. S. Motor specification or better. Rigid specifications also are laid for the motor oils sold by Dixie distributors. Besides the Dixie brand of motor oils any member of the group may handle nationally advertised brands if he desires. J. J. Theisen says the Dixie distributors of Michigan have made such rapid strides of progress in the last two years that it has surprised even its own members. One of the most recent additions to the Michigan group was the Lincoln Oil Co. of Detroit, headed by Charles Rath.

When the Wisconsin group met in Chicago they went into the most minute details of their merchandising plan. Every member, according to their agreement, must give up all of his local brands of gasoline at once. Every truck, pump and service station building has to be painted to Dixie colors by May 1, no matter if the jobber just got through painting them his own colors.

They are not required to paint their bulk plants until they need it, but, when next painted, they must likewise come to Dixie colors, white, yellow and blue. All station salesmen in Wisconsin will be in uniform, the same uniform for all companies. All will be required to greet customers

"What's in a name?" "EVERYTHING", *answers the American Public - - -*

THE American public buys on faith and repeats on confidence.

Confidence forms the very foundation on which the structure of satisfactory relationship between buyer and seller exists.

"Defiance" performance—based on years of experience in studying the practical requirements of the oil industry—is the explanation of the high regard in which "Defiance" Steel Barrels are held in the industry.

Our constant care is to see that this reputation is upheld through consistently maintaining the quality that has identified "Defiance" Steel Barrels with a high degree of value among buyers in the oil industry.

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with the Dixie salute and if there is a woman in the customer's car, the hat must come off.

The Wisconsin jobbers are not going to give up the various gravities of gasoline with which their trade is familiar. They have made arrangements for members to market as many as five grades of gasoline under the Dixie brand. Each will be designated by color of the pump and color of the pump globe.

All gasoline pump globes will have the same face, showing the Dixie trade mark, but the outer rim of the globes will run to many colors. Moreover, the globes will not be circular but oval in shape and each will have a collar with at least one word on it to identify it. For instance:

The globe over the 60-62 gasoline pump will be marked "Dixie," colored blue, and show the words "Power to Pass."

The globe on the 64-66 pump will have the same face and show the name "Dixie," but the collar will be marked "Liberty" and the globe colored yellow.

The 68-70 pump will bear the words "Blue Streak" on the collar and the globe will be red. The globe on the benzol blend pump will be green and bear the word "Benzol."

A plain white globe will adorn the anti-knock pump and the word on the collar of the globe will be "Nockout." The upper half of every gasoline pump will correspond to the glass globe in color.

Mr. Rentmeester says all the Wisconsin members are under bond of $1000 to comply faithfully with the agreements of the group as a whole.

Oil Trademarks for Copyright

The following are trademark applications pertinent to our field pending in the United States Patent office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Barrister Building, Washington, D. C., trade-mark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

"B" The letter "B" is black with a white arrow on it. No. 262,198. The Bartles-Maguire Oil Co., Milwaukee, Wis. For gasoline, motor oil, and other lubricating oils and greases.

"MORE POWER TO YOU CALPET" No. 241,392. California Petroleum Corp., Los Angeles, Calif. For gasoline.

"PUROL" No. 242,208. The Pure Oil Co., Chicago, Ill. For kerosene, benzine, distillate, and lubricating oils and greases.

"PENEGRAPH" No. 248,849. George Addison Lazear, Irvington, N. J. For penetrating graphite oil.

"LENA MIXTURE" No. 259,367. Looboyle Refining Co., Tulsa, Okla. For gasoline and lubricating oils.

Many filling station operators pay for their Buckeye Specials by hauling gas from bulk stations for their own needs, and for the needs of other filling stations.

400 GALLON BUCKEYE SPECIAL ON "A A" MODEL FORD

If you operate a Ford, Chevrolet, Dodge, or any other small truck, you are bound to be interested in the construction and price of the BUCKEYE SPECIAL.

Buckeye specials are built substantially like the larger Buckeye jobs—come in sizes suitable for 1 and 1½ ton trucks—and are priced to interest you.

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Gasoline, Gas Oils, Petroleum Coke

FUEL OILS

LUBRICATING OILS

Cylinder, Engine, Cordage

RED AND PALE PARAFFINE OILS

Pipe Still Gives Economy in Making Pennsylvania Lubes

By Alfred Mullhaupt Jr.*

Delivered before National Petroleum Association, Cambridge Springs, Pa., April 19

PIPE stills and fractionating columns are being installed because they reduce the cost of refining oil.

As recently as a year and a half ago, the question in the mind of the average refiner was, "Will they work on Pennsylvania oil?" Today, the question is, "What is the best type?"

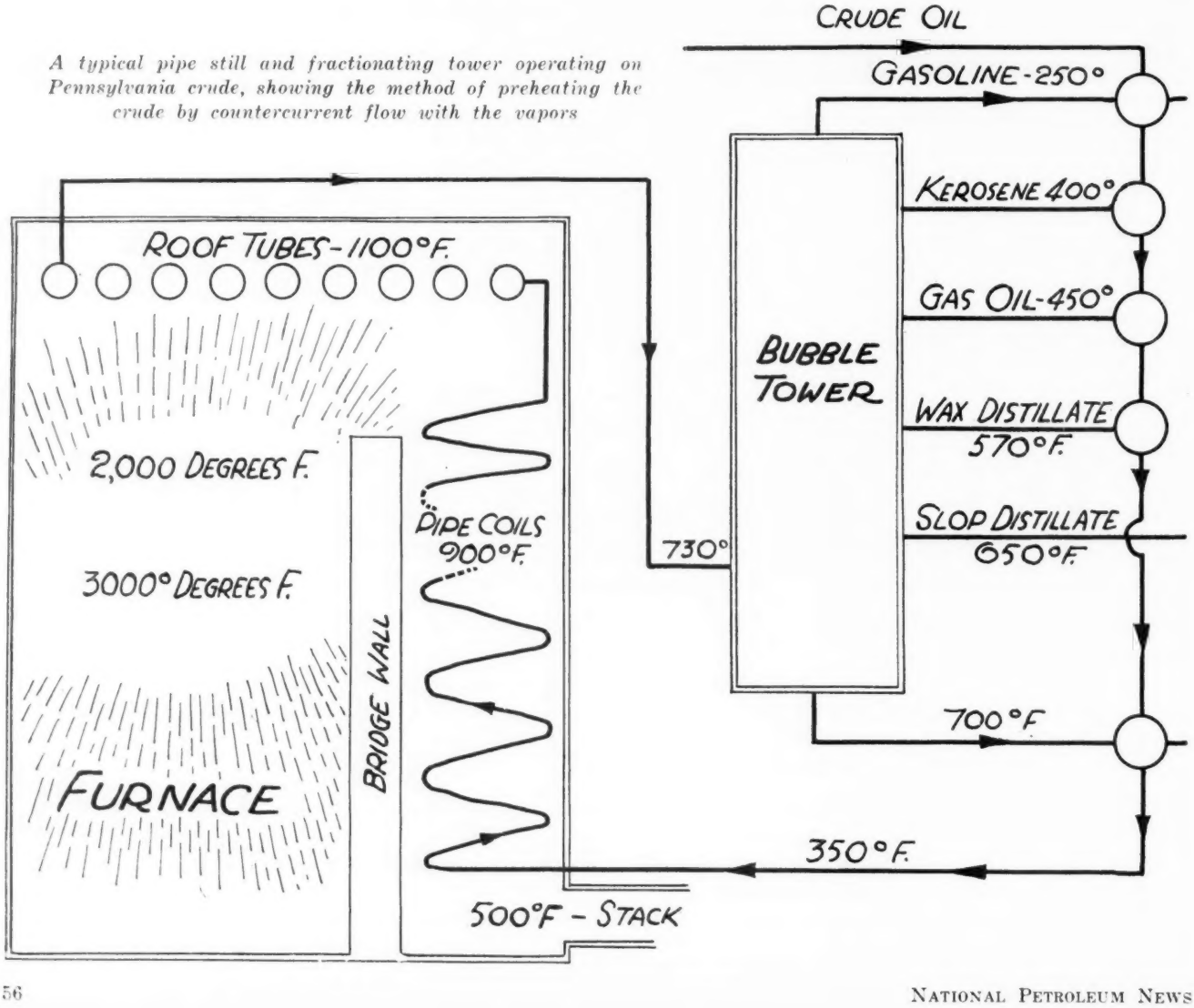
The problem is complicated by what the motor and bearing manufacturers are going to do and what kind of lubricants they will require in the future.

On some types of engines it may be necessary to include the oils having a boiling point of around 800 to 900 degrees F. to insure lubrication under all conditions, even at the expense of slightly greater carbon formation. In others, an overhead distillate might be best adapted, in which all the oil would volatilize at a lower temperature and thus reduce the carbon formation. If it is possible to decide the exact specification required, it is a simple matter to select a distillation unit to produce the results. There does not seem to be any limit to the size of a pipe still unit with a single fractionating tower. At the present time there has been some trouble with the use of two coils in multiple in a single furnace, but this can be overcome by using an individual pump, or orifice control valve, to hold a constant throughput in each coil, which would permit three or four, or more, coils in multiple in an individual pipe still if desirable.

The radiation losses do not increase in proportion to the throughput. The capacity of a plant of a given construction is roughly proportional to the internal volume of the tower, piping and heating tubes, which is proportional to the cube of

*Chief engineer, Kendall Refining Co., Bradford, Pa.

A typical pipe still and fractionating tower operating on Pennsylvania crude, showing the method of preheating the crude by countercurrent flow with the vapors



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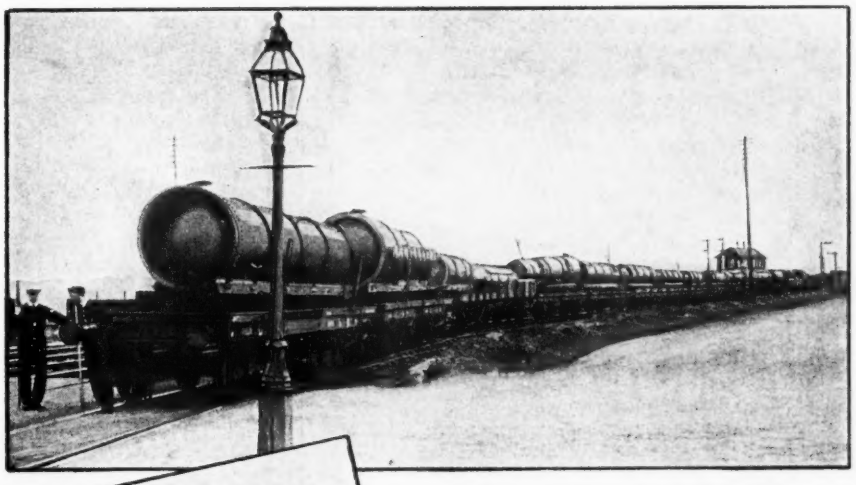

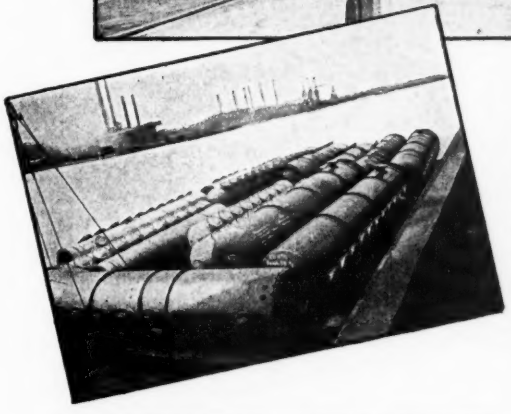

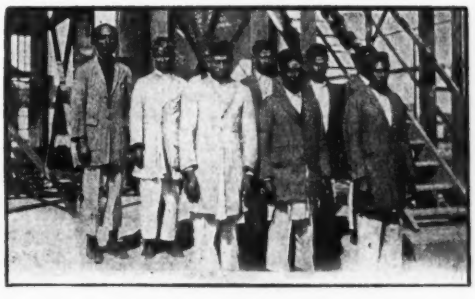

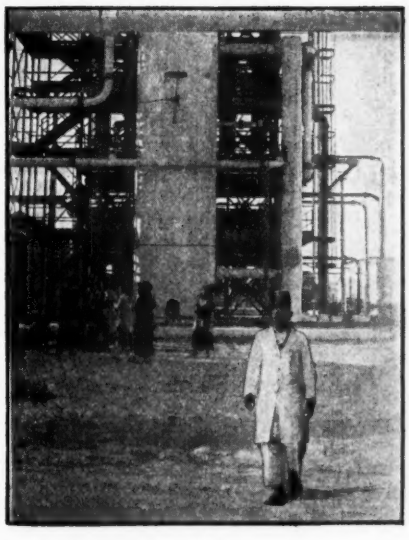

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Empire Refineries, Inc.

Marland Oil Co.

Vacuum Oil Co.

Associated Oil Co.

Barnsdall Corp.

Humble Oil & Refining Co.

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any dimension, while the area of the furnace, hot pipes and towers is proportional to the square of the same dimension.

This means that the radiating surface does not increase as fast as the volume, so that, in a large unit, the radiation loss is less than in a small unit, per barrel throughput.

It requires practically the same number of men to operate a small unit as a large unit.

The fact that the pipe still unit lends itself to continuous operation permits the recovery of heat, by pumping oil to be heated in thermal contact with oil or vapors to be cooled.

Batch distillation of crude to cylinder stock in a shell still can be carried on fairly economically, as far as fuel for combustion is concerned, providing each still is fitted with a flue gas recirculating system, an air preheater with forced draft fan, with everything well insulated, forced circulation of the oil on the bottom of the still, with vapor heat exchange, preheating crude for a second unit being warmed up.

The cost of applving all these small units to batch stills is greater per barrel of throughput than that of a modern pipe still unit.

CRACKING is a function of time and temperature. If you reduce the temperature, you must increase the time. For this reason most cracking plants have a reaction chamber, where the hot oil can remain for a longer or shorter time until the cracking operation is completed.

This reduces the temperature to which the oil must be heated and therefore reduces coking of the tubes and formation of coke in the expansion chamber. The shell still has a long soaking period and the temperature to which the oil can be heated is lower than it would be if the oil were under high temperature for a shorter period, a minute or two.

The maximum temperature being limited on the batch still, an enormous quantity of steam must be used to reduce the vapor tension to maintain the required law still temperature. This steam costs money, and it also costs money to condense the steam. A part of the heat of this steam can be recovered by running the stills in a continuous battery fitted with vapor exchanges, but this, if anything, would increase the time of soaking at high temperatures.

Therefore, even though fairly high heat efficiency can be obtained by shell stills, they are more liable to injure the oil than a properly designed pipe still with fractionating column.

Fifteen hundred barrels a day of crude throughput will show an earning in favor of such a unit. With batch stills and no fractionating columns certain products had to be rerun several times with the attendant cost, losses, and reduction in color.

Advantages of Pipe Stills Over Shell Stills

Finished cuts can be made with narrow boiling ranges.

Fuel is burned at maximum efficiency.

Oil is heated without burning.

Large capacity in small space.

Maximum heat recovery through counterflow.

Minimum quantity of water required for cooling.

Minimum quantity of steam required.

Filter house benefited because no color is put into the oil by fractionation process.

All variables may be controlled automatically to secure uniform cuts.

WHEN operating on crude for lubricating oils, it is usually desirable to operate in such a manner that the chemical nature of the oil is not changed.

With an adequate fractionating column, the crude can be split up into its component parts with respect to boiling points. With a properly designed tower of this type, it should be possible to take a proportionate sample of each stream, put them together and have the resultant sample virtually the same color and gravity as the original crude. A temperature of 730 degrees F. with the flash system gives a better colored cylinder stock than 650 degrees F. on batch stills, due to the short length of time the oil is at this temperature.

The flash system uses the gasoline in the crude to reduce the boiling point of the cylinder stock and heavier oils, which causes them to vaporize with the use of a comparatively small quantity of steam at a temperature much below their boiling temperature at atmospheric pressure and in an atmosphere of their own vapors. This reduction in the boiling point is probably in the neighborhood of 100 degrees F.

In refining Pennsylvania crude it probably will always be most desirable to split the crude up without any pyrogenic decomposition. It is within the realm of possibility, however, that a refiner using a so-called naphthene base crude will be able chemically to transform his oil by means of a unit built for higher pressures and temperatures and adding hydrogen, so that he will take from the plant lubricating oils having properties very similar to lubricants made from paraffine base oils.

If for any particular oil, soaking at high temperature is desirable to give a darker color or turn

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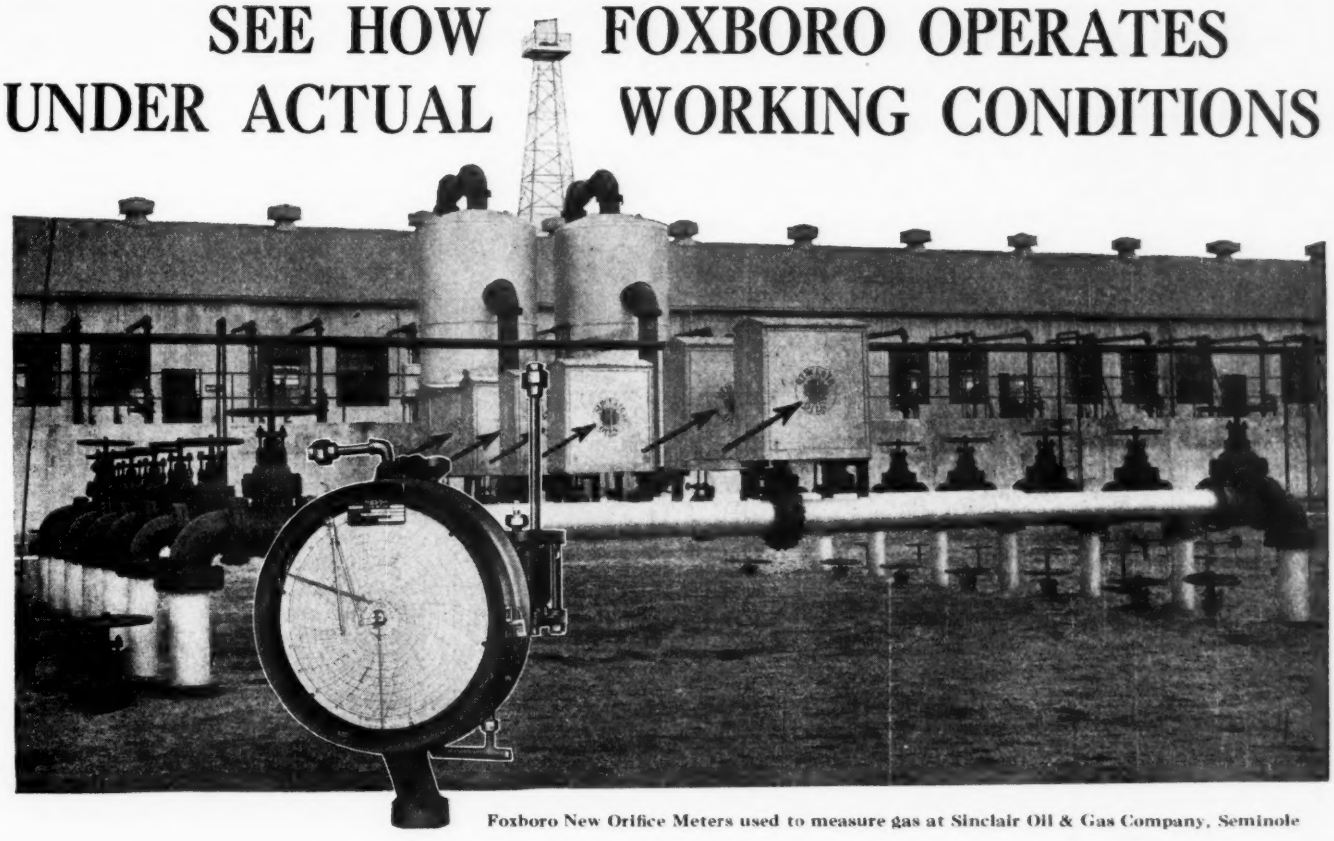

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some components of the oil into resin or tar, it is only necessary to install a soaking drum between the pipe still and the tower.

Let's consider some of the things that happen in a pipe still operating under average conditions. Assume a pipe still running 2000 barrels of crude per day vaporizing 85 per cent and heating to 730 degrees F.; suppose 2.7 per cent, or 54 barrels per day, are being burned say with 12 per cent CO_2 and 20 per cent excess air. Assume that this fuel is being burned in one burner, the combustion will take place in the form of a cloud of luminous flame.

The interior of this opaque cloud of gas may be at the full temperature of combustion, as heat will not radiate through an opaque mass, although the outer shell or envelope may be cooled by radiation.

This cloud of luminous flame has the property of conveying at least twice as much heat to any tubes it happens to touch as the body of red hot transparent gas which surrounds it. Therefore, it should not be allowed to touch the tubes.

The red hot transparent gases which are being produced in constant stream are carriers of heat. Due to the fact they are so hot they have a tendency to radiate heat to anything in sight. The red hot bricks in the furnace wall radiate back heat towards these gases because, due to the thickness of the wall, the heat does not pass through the wall fast enough to cool the interior surface very much. The radiant bank of tubes which may be in the roof and part of the side walls are carrying oil at a much lower temperature than the flame.

THESE tubes will have a cooling effect on the transparent red hot gases, red hot side walls and the outside lining of the cloud of luminous gas which will radiate heat from its outside surface through the transparent gases as though the latter were not present.

All this heat transfer would take place if there were a transparent window covering the tubes, so that no hot gases could touch the radiant tubes. The rate of heat transfer due to radiant heat is 10 times as great at 2800 degrees F. as at 1000 degrees F. If a large down-draft suction pipe were inserted through the bottom of the furnace and all gases of combustion were removed, so that none touched the radiant tubes, this radiant heat would still pass to the tubes in position to receive it.

A given quantity of heat is produced and it must go somewhere. If the absorbing surface is 1000 square feet instead of 100, each square foot will only have to absorb one-tenth as much heat.

It is possible, by introducing enough steel tubes in the furnace,

to bring the furnace temperature so low that complete combustion would be difficult to secure, but, of course, this is not desirable.

By making the radiant heat surface large enough, the furnace temperature can be reduced to a point where the gases produced by combustion of oil and air, may be passed at comparatively low temperature over the connection bank which is shielded, that is, cannot see the cloud of flame. Radiant heat moves in a straight line, although it may be reflected the same as light by a hot surface properly located.

THUS the designer of pipe stills has means of carrying on combustion with the minimum excess of air, high CO_2, and accompanying high fuel efficiency, and still maintain low rates of heat transfer without the use of recirculating flue gas equipment.

These units running on cold crude will probably recover heat of vaporization that will bring the temperature of the oil charged to around 350 degrees F., which will give 150 degree temperature difference between the oil charged and outgoing gases, which, in turn, would give a flue gas temperature of about 500 degrees F. This means a thermal efficiency of 70 per cent.

This type of equipment has a definite rating, which can only be exceeded at the expense of color, thoroughness of fractionation, or both.

In selecting a unit, each individual tower, or section of a tower, should be large enough to handle the maximum quantity of oil that might be put through this particular stream. For instance, take the case of the top three sections of a tower designed to produce equal quantities of gasoline, naphtha and kerosene. If the market price should change to make it more profitable to take more gasoline, the section should be large enough to give good fractionation at this maximum possible load.

By using the large fire box type, powdered coal can successfully be used as a fuel, providing the tubes are fitted with suitable soot blowers. Recirculating fans would not be necessary with powdered coal, as combustion can be carried on with a high CO_2 percentage without overheating the oil.

Those units, taking oil at 600 to 650 degrees, would require air preheaters to recover the heat in the flue gas, as the stock temperature would be from 750 to 800 degrees F. The fan would work on cold air which is not so troublesome as hot flue gases.

In commercial practice as high as 95 per cent of the oil is vaporized in the pipe still before going to the fractionation tower. Under these conditions, the bottom section is a mist separator where the mist is the flux bottoms. To strip the lighter fractions completely in the bottom of the tower, superheated steam is introduced at a temperature of 700 degrees F. This same stream passes all the way up through the tower, helping reduce the vapor tension of all the other fractions, giving up its heat in the gasoline vapor exchanger.

The exchangers and coolers for a unit of this size, except for the gasoline exchanger, are small compared to shell still operation, because the heat given up in condensing a pound of oil is from 140 B.t.u. for gasoline to 80 B.t.u. for cylinder stock, while the heat given up by one pound of steam is around 900 B.t.u. The steam is condensed only in the gasoline vapor exchanger.

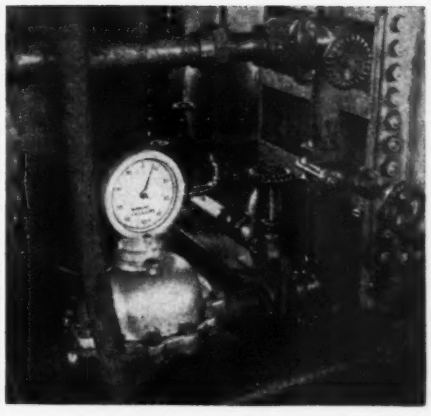
VAPOR exchangers are subject to some corrosion, due to hydrochloric acid originating in the salt water generally found in crude oil. Whether or not these chlorides have a tendency to cause the oil to crack at a lower temperature, similar to the action of aluminum chloride is an open question. Except at the high temperatures in the pipe still, there is apparently little corrosion until that part of the tower is reached where the hydrochloric acid gas begins to condense.

Most of this takes place in the gasoline vapor exchanger, where water vapor dilutes the acid. The collapsing vapors cause a sort of a blast against the tubes which gives a combination of erosion and corrosion. If it is possible to locate a settling drum in the crude line through the vapor exchangers, at a point where the salt water would be dropped out, it would eliminate or reduce this corrosion.

A baffle, where the vapors enter, should be used to prevent the blast of vapors from beating directly on the tubes and thereby increase their life.

When running Pennsylvania crude to long residuum, the wax stays down in the long residuum. When running to cylinder stock base for bright stock the wax comes off in two cuts, one of which is a pressable wax distillate. The other must be cracked to press successfully through a filter press.

Due to the fact it is impossible to foresee all the operation that might be found desirable in a unit for an existing refinery, the unit should be flexible. Each refinery having established grades will have to do considerable research work to apply the products coming from these units to these present grades.



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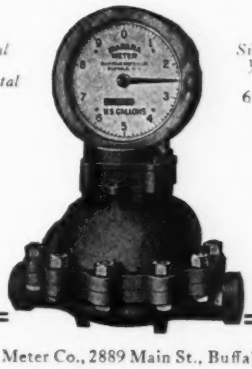

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Show us how Niagara Oil Meters will give *accurate* measurements on:

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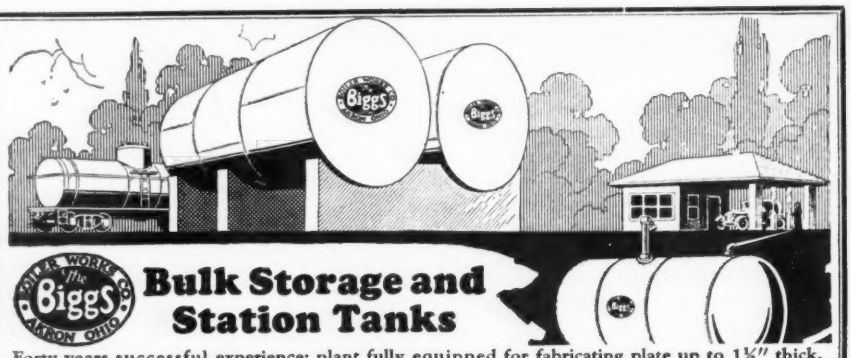

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Alliance, O.—Paul Agnew, filling station.
Postville, Ia.—Casten Bros., filling station and garage.
Lexington, Ky.—Hargis Hughes, filling station.
Cherry Fork, O.—W. A. Cornelius, filling station.
Forest, O.—Shell Co., filling station.
Reinbeck, Ia.—Ontjes-Frerichs Oil Co., filling station.
Traer, Ia.—A. M. Ledvina and Gavrolese Franklin, filling station.
Muscatine, Ia.—J. T. Sissel, filling station.
Mt. Vernon, Ia.—F. J. Bittner, filling station.
Ackley, Ia.—Rufus Hilbrand, filling station.
Eldora, Ia.—Harvey Carr, filling station.
Baraboo, Wis.—Otto and Edward Ritzenthaler, filling station.
Olivia, Minn.—Standard Oil Co. of Indiana, filling station.
Des Moines, Ia.—A. H. Coburn, filling station.
London, O.—Dr. Kilby Farrar, filling station.
Celina, O.—William Brown, filling station.
Red Cloud, Neb.—O. D. Hedge, filling station.
Wisconsin Rapids, Wis.—C. C. Knudson, filling station.
Madison, Wis.—Albert Kraft, filling station.
Springfield, O.—William Vanderpool, filling station.
De Pere, Wis.—Frank Zilman, filling station.
Madison, S. D.—Madison Oil Co., filling station.
Fairmont, Minn.—Martin Nelson, filling station.
Edinburg, N. D.—Mutual Oil Co., bulk station.
Philadelphia, Pa.—Crew Levick Co., filling station.
Bridgeport, Neb.—H. Clark, filling station.
Davenport, Ia.—Davenport Oil & Supply Co., filling station.
McGregor, Ia.—C. G. Lanning and G. H. Butterfield, of Waverly, filling station here.
Lexington, Neb.—Standard Oil Co. of Nebraska, filling station.
Madison, Wis.—R. M. Koen, filling station.
Wessington Springs, S. D.—Clarence Dirks and Ted Donnelly, filling station.
Webster, S. D.—E. C. Link, filling station.
Vermilion, S. D.—Elmer J. Wight and John A. Carlson, filling station.
Ree Heights, S. D.—M. L. Paine, filling station.
Minneapolis, Minn.—A. F. McKeever, filling station.
Belle Fourche, S. D.—H. L. Ruyle, filling station.
Langdon, N. D.—A. F. Kieffer, filling station.
Staples, Minn.—Elmer Grant, filling station.
Fairmont, Minn.—Martin Nelson, filling station.
Houghton, Mich.—Angelo Villanelli, filling station.

Six-Day Week for Drillers

SAN FRANCISCO, April 28.—The adoption of a six-day week for drilling crews instead of the traditional seven days, has just been announced by the Standard Oil Co. of California. This improvement in working conditions compares with the adoption of the eight-hour day in place of a 12-hour day, which the Standard of California claims to have been the first oil company to put into effect in 1917.

The company's drilling crews will now operate six eight-hour days per week with two weeks' annual vacation with pay.

Bogey

Of Daily Overhead Costs

Spurs

Station Men to Greater

Sales

By Ward K. Halbert

N. P. N. STAFF WRITER

L. V. WHITE

Of the L. V. White Co., Kalamazoo, Mich., who has graphic charts at his stations to chart sales progress

KALAMAZOO, April 27

HOW much business must a service station do a day to make money?

Of course it depends on the station, because some are more expensive to operate than others; and on the merchandise, because some items are more profitable than others.

But the question has an answer for every individual station.

L. V. White, head of the L. V. White Co., Kalamazoo, Mich., answers it for each of his nine stations.

Every morning at 9 o'clock he knows which ones made money for the company the day before, and how much. He knows the ones that lost money, and how much. This information has led naturally to three big accomplishments:

1. He has devised a bonus system which makes his station men better salesmen, harder workers, more prosperous and happier.

2. He has developed a guide for his executives, helping them to find quickly and to concentrate on stations that need attention and help them to get out of the red.

3. He has been able to build up motor oil sales until his stations averaged a quart to every 6¼ gallons of gasoline throughout 1927.

The information about what the stations do is not confidential to the executives. Every workman at every station knows exactly what his station did the day before and how much he personally contributed to that gain or loss. In fact the station men keep the record themselves. Each man knows what he has been worth to the company before he goes off duty every day.

At every one of the L. V. White Co. stations is a graphic chart covering the calendar month. It is not posted on a board for public inspection, but is on a strip of graph paper about a yard long, doubled twice and jacketed in a cardboard folder about the size of a letter file.

The chart is taken out of the desk drawer regularly three times a day, twice to be posted and once when Ernest C. Hall, assistant superintendent in charge of stations, comes around on his daily tour of inspection.

The day, at Mr. White's stations, is divided into two shifts of 9 hours each; 6 a. m. to 3 p. m., and 3 p. m. to midnight. When each shift is over, the man in charge of the station marks up the record of himself and his crew before going off duty. The second shift man marks up also the complete record of the station. The accompanying cut shows the sales record at one station for the first ten days of March.

This small segment of one of the station graphs is enough to show how it works. The curve for a bigger station would appear higher on the sheet, which provides a spread of zero to 1000 gallons. The record of a small station was selected purposely because of its simplicity and because it is more nearly like the average filling station. Station X is in the 500-gallon class and works only one man to a shift.

The record fits nicely on decimal graph paper. Ten small squares fill one side of a large square, and ten large squares fill one end of the paper. The vertical coordinates show gallons; ten gallons to one small check and 100 gallons to a large one. The horizontal coordinates show time; one day to a big square. The small checks do not signify anything from left to right.

The lower curve shows the personal records of the men on the station. The upper curve is the station's total sales record. The solid black line at 330 gallons is the "dead-line." Unless the station's average daily sales exceed that, it is not paying its own way.

The dashed line six squares above the "dead-line" means that this station fell short of its quota in February and must sell 60 additional gallons a day all during March to make it up. As sales increase and the deficit is made up the dashed line sinks down until it coincides with the "dead-line."

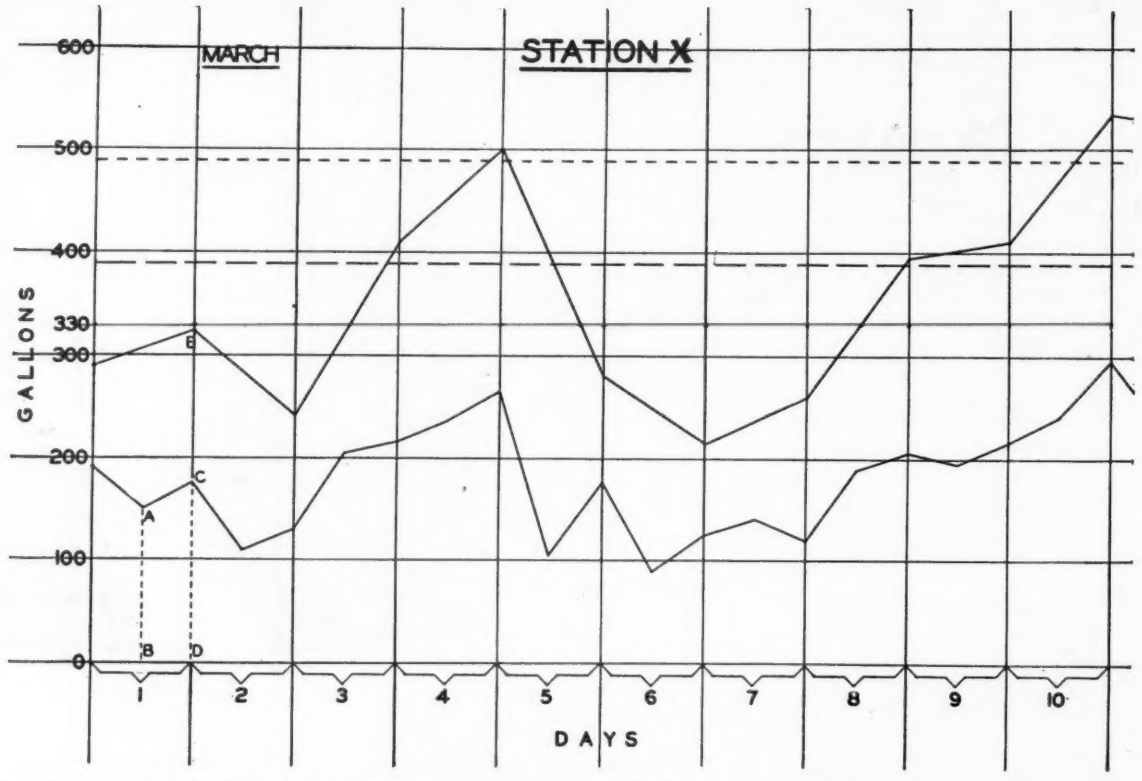
The dotted line at the top is the profit line. It stands arbitrarily 100 gallons above the dashed line, never closer to the "dead-line" than 100 gallons. In other words, if this particular station sells 330 gallons a day it is only paying its own way, but, if it pays adequate dividends to stockholders, it must make up all previous shortages and then shoot 100 gallons beyond, passing the profit line.

The space above the profit line is the zone of the bonus. A station that passes its profit line is paying its own way and earning what is considered fair return for the company. So, every gallon sold above the profit line earns one cent to be divided among the men that work at this station. The bonus is paid monthly.

Mechanical workings of the chart are simple. Follow briefly the treatment of the chart at Station X for one day. Mr. Day works the early shift and Mr. Knight the late shift. (The names are not actual).

When Mr. Day opened the door and primed the pumps at 6 a. m., on March 1, he had a clean monthly graph sheet to use. The black line, the dashed line and the dotted line were drawn in for him with ink. Besides there were two dots on the left-

How Each Operator's Sales are Charted Against the Station "Dead Line"



Operators at each of L. V. White Co.'s retail stations keep a record of business on a chart like this. The upper curve shows the station's total sales. If it does not cross the heavy line shown at 330 the station is not paying its own way. When it passes the dotted line at the top it pays a bonus to the workmen. The actual chart has the big squares divided into ten smaller squares each way, which are not shown in this reproduction

hand margin. The upper dot at 290 meant that the station sold 290 gallons the day before. The lower dot at 190 showed that his partner on that station sold 190 gallons before he closed the night before.

Mr. Day worked as usual until 3 p. m., March 1, and sold 150 gallons. The business day was half done and he was ready to leave, so he placed his pencil on the "zero line" in the middle of March 1 (at the point *B*) and counted upward 15 small squares, or 150 gallons, and made a dot indicated by the letter *A*. Then he drew a line connecting *A* with the close of business the day before.

Mr. Knight started to work at 3 p. m. and sold 175 gallons before midnight. The business day was over, so he put his pencil on the "zero line" at the close of March 1, and counted upward 17½ small squares and made a dot at point *C*. Then he connected *A* and *C*.

The line *AB* shows Mr. Day's 150 gallons and the line *CD* shows Mr. Knight's 175 gallons. They aggregate 325 gallons, the total for the station. Mr. Knight shows this on the chart by placing a dot at the point *E*. Then he starts the upper curve by connecting *E* with the dot on the margin at 290 which was the total gallonage of the day before.

The record goes on like this throughout the month. The lower curve perpetually compares the early and late shift and when, at the end of a week, the men exchange shifts it enables them to compare themselves. If Mr. Knight sells more merchandise than Mr. Day consistently, no matter which shift he has, he is obviously a better salesman. The upper curve contains the same information, shown more clearly without the personal element.

Behind the simple mechanics of the chart are some carefully devised figures. How are the arbitrary lines established? The "dead-line" for each station is figured separately, without regard to any other station or the bulk plant. Each retail station has a different "dead-line."

When the management instituted this system they went back over the records of three years and arrived at an annual operating cost for each station and reduced that to a daily operating cost in dollars and cents.

They ruled arbitrarily that every station should sell at least one quart of motor oil for every seven gallons of gasoline, counting a pound of grease as a quart of oil. They allowed each station a margin of 3 cents a gallon on gasoline and 14 cents a quart on oil.

Holding to the ratio of one quart of oil to seven gallons of gasoline, each station would be able to earn $1 in gross return from the sale of 21 gallons of gasoline and three quarts of oil. (It actually figures $1.05 but the nickel was erased from the calculation as a margin of error). Thus they undertook to hold up the ratio of oil sales to "1 to 7" and call 21 gallons of gasoline sold equal to $1 earned.

By this formula they interpreted the daily operating cost of a filling station in terms of gallons. A gallon, as it shows on the graphic chart, does not mean a gallon of gasoline. It is called a gallon, but it is really a private unit of cost. It is actually a gallon of gasoline with which correct amounts of oil and grease have been sold—three quarts of oil with 21 gallons of gasoline being equal to $1.

The operating cost at each station was figured minutely to include 15 items. They were labor, rent, electricity, telephone, heat, water, property taxes, pump taxes (municipal), depreciation, insurance, outage, interest on investment (at 7 per cent), prorated expense of supervision, supplies and miscellaneous.

The prorated expense of supervision is simply Mr. Hall's salary and that of his secretary spread equitably over the nine stations. Supplies include clean rags, paper cups and stationery. Miscellaneous covers all small unlisted items of expense.

The expenses were figured so carefully that one station which is almost charged off the books has a depreciation of 1 per cent on drive-

Certified MOTOR OIL

The GOES FARTHER DEEP-ROCK LASTS LONGER GREASE Story

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100% PURE PARAFFINE OIL

MEET THE FARMER HALF WAY HE WANTS THIS BETTER OIL

The next few months will see the farm market at its peak. Get your share of this business. Get ready for it and go after it.

The farmer needs good lubricants *now*. Sell him Deep-Rock Motor Oil for truck, tractor and automobile.

Do you realize the great profit possibilities for you in Deep-Rock Lubricating Oil? It sells and resells because *it is right*. Compare it with the finest brand you know.

Deep-Rock Oil is 100% pure paraffine oil made from selected crudes taken from the Cushing Pool.

Deep-Rock Motor Oils and Greases are made to withstand the toughest usage under any condition.

Deep-Rock Motor Oil is one of a complete line of petroleum products—established and popular trade-marked brands—covered by the Deep-Rock franchise. This franchise means for your exclusive territory protection and complete independence.

In addition, the Deep-Rock Franchise provides a free laboratory and consulting service, merchandising helps and liberal advertising support.

Prompt deliveries assured by eight compounding plants situated at strategic points throughout the middle west.

You are offered a connection with a reputable company, clean-cut and progressive methods of doing business. If we are talking your language here, write today for complete detailed information.

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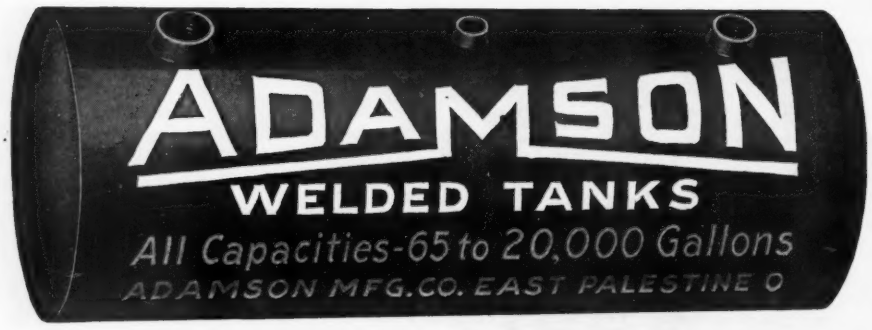

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Gasoline & Kerosene

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CHOICE OF FOUR TYPES OF PUMPS

On our "A" & "B" Unit we furnish the job complete. Pump, hose, tank, locks, pipe and all fittings. Any handy man can install in less than one hour.

Increase gallonage per route trip! Better gasoline. Your customer will be satisfied. *Our prices are right.* Write today!

THE MARS CO., *Mfrs. & Distr.*, 179 S. River St., Aurora, Ill.

WITHIN OUR GATES

Within our gates is a great organization of trained mechanics—welders, riveters, shearsmen, layout men—all of the skilled artisans who are necessary to produce an exacting standard of general steel storage. Not the ordinary "run-of-mine" men who can hold down jobs in any old shop, but men who have fostered and realized their ambition to build better tanks.

Write for a free copy of Bulletin No. 15.

The Youngstown Boiler & Tank Co.
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Youngstown TANKS "KEENE STANDARDIZED MADE"

ways and 15 per cent on pumps. Finally, when total expense was reduced to a daily basis and converted into gallons by the formula described before, the station workmen were taken into the secrets of the chart.

Mr. White did not call the whole force together and try to sell his plan to them collectively. It was too intricate and required more thinking than most men can do in a crowd. So he held 18 conferences, with two or three men to the conference. At these meetings he presented each station crew with their actual cost data, showed them what they had to sell to make good their enterprise, and told them what margins could be allowed. It was a flat 3-cent spread on gasoline, 14 cents a quart on motor oils and about the same on a pound of grease.

Mr. White told them also at these meetings that the company was no longer calling its outlets "filling stations," nor "service stations," nor "gas stations," but "Sales Stations." He outlined a carefully devised selling program at the same time. Most of his men accepted it enthusiastically. Those who really believed in their own abilities to sell were strong for the bonus system, although most of them were literally astounded at the overhead cost of a service station.

"The system has done this for our company," Mr. White said. "Men at the stations have quit figuring their accomplishments on a basis of cash receipts. They used to imagine when they took in $50 it was a big day. They seemed to look upon it as all profit for the company. Now they understand that only a small part of it represents gain, perhaps no part of it is gain.

"The men appreciate their bonus. The executives used to be approached for a raise in pay by some of the men every day. Now they know what they can do to earn more money. The sky is the limit and we don't care how much they make; the more the better.

"We have observed instances where a man on the late shift will come to work early and the man on the early shift come back to the station after supper to help serve the trade. Both were so afraid some business would get away from their station that they voluntarily worked overtime.

"Last winter, when business was slow and all stations were running in the 'red,' the men never got discouraged. They seemed to work harder. They knew that if only a small deficit accumulated in winter, they would be able to get their sales into the bonus zone that much sooner in the spring. Two of our men worked so hard last winter that they actually drew customers clear across town (past two of our own stations) by their unusual speed and courtesy.

"This system, in my opinion, is far better than offering station salesmen

a bonus on their motor oil sales only. Placing a premium on the selling of some special item, just because it is profitable, is not fair to the customers. A bonus on motor oil sales tempts some men to sell a customer too much motor oil, which is just as bad as not enough."

The accuracy of each station's chart, as well as the effectiveness of the plan generally, depends on the ability of the salesmen to keep up the ratio of oil sales to gasoline sales. This is handled by another simple plan.

Every ten days every station salesman is issued a card from the office telling him what his ratio of oil sales has been. Each card tells the man whether his efforts in that direction have been good, fair or poor. Data for the cards come from the daily station reports and are official.

The cards frankly ask the men to sell one quart to every six gallons of gasoline, although the cost unit actually contemplates only a quart to seven gallons. During 1927 the average ratio for all company's sales stations was a quart to 6¼ gallons and the best station had ratio of one quart to 3½ gallons. This was the best showing the company ever made.

"Compulsory inspection" is the backbone of the plan which sells the lubrication. A gasoline customer in an L. V. White Co. station gets his oil examined whether he asks for it or not. The salesman does not ask if he may inspect the oil. He inspects it before the customer has a chance to protest.

In like manner, any customer who goes on one of the White Co.'s drain pits or racks has his transmission and differential examined. Workmen there are instructed also to "Look, don't ask." As a result the company's grease sales averaged 14 ounces for every car on the pits in 1927.

Of course that is not all there is to the sales plan. It has been worked out carefully by the sales executives, including Mr. White, his superintendent, William A. Clark, and Mr. Hall. They have had some expert help besides. The men are told what to say to customers, how to dress, how to carry themselves, where to stand when a customer drives in, and all the details of personal conduct at the station. Mr. Hall says more can be accomplished along this line by example than by preaching. He goes out and works as a "pump boy" at the stations himself occasionally, staying from two hours to two days at a place, to show the other men how it is done.

BARTLESVILLE, April 28.—Arthur V. Hoenig, vice-president of the Indian Territory Illuminating Oil Co., is now maintaining offices in the Bartlesville headquarters of the company. Until recently he spent all his time in the Seminole district.

Our plant at Newark, N. J. is ideal for your Eastern Trade

Our plant at Toledo, Ohio is ready to serve your Western Trade

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QUALITY GREASES

To the Jobber Who Specializes in Quality

We offer a full line of High Grade Lubricating Greases —Quality unsurpassed—Prompt service—Reasonable Prices.

CUP GREASES made in all densities—From liquid to hard.

TRANSMISSION AND DIFFERENTIAL LUBRICANT—Uniform and dependable—A high grade product suitable for all cars—Results equally satisfactory Winter or Summer.

PRESSURE LUBRICANT—A soft, smooth, well-made lubricant of uniform consistency—Especially produced for use in all Pressure Systems.

We also manufacture a full line of AXLE GREASES—GEAR COATINGS—CUTTING COMPOUNDS & SPECIALTIES.

Samples and prices given on request

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Gasoline And Other Motor Fuels

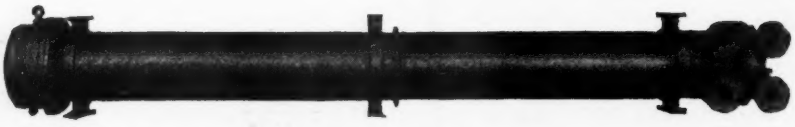
by Ellis and Meigs, is a book which gives a complete survey of the field and a description of practically every process of making gasoline and most other motor fuels of promise or prominence.

The price of the book is $10. Just send us your check and we will mail a copy of it to you.

National Petroleum News, 1213 W. Third St., Cleveland, Ohio

Low pressure-loss

G-R Heat Exchangers



THE patented baffle arrangement in G-R shell-and-tube type heat exchangers offers minimum resistance to the flow of vapor or liquid being cooled. The special design and spacing of these baffles have been determined by extensive experience with the various fluids handled in refinery operations, and vary with the particular requirements of each service so as to assure least possible pressure loss.

Note these other features of Griscom-Russell Heat Exchangers

Easy to inspect and clean.
Compact.
Flexible capacity.
High salvage value.
High heat transfer rates.

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Shell-and-Tube, Atmospheric, and Condenser Box Types
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LEVEL CONTROLLERS

Griscom-Russell

Heat Transfer Apparatus

"Good morning, Mrs. Smith"

A CHEERY greeting! A welcoming smile! It's the better way to win and hold customers.

Why shouldn't the dealer who uses G & B Visibles smile? G & B Pumps are easy to operate. No fatigue—no backaches—even at stations where thousands of gallons are served daily. No eight o'clock smiles turning into ten o'clock frowns.

Your dealer will appreciate the many features of G & B Visibles that make his work more pleasant and more profitable. The same smooth, steady action drains gallon after gallon from the bowl. Speed and accuracy in delivery save time and effort. The G & B Progressive Method of Delivery facilitates the sale of extra gallons.

Write for Bulletin T-176 describing wet hose sight measure type; or for Bulletin T-179 giving details of mechanical measure model.

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Our Industry — A Page of Facts and Personalities

National Petroleum News

By Paul Wagner

HARRY J. MORLANG
Manager in the North Central Texas territory for the Oil Well Supply Co.

Harry J. Morlang, Fort Worth manager of the Oil Well Supply Co., has been in the North Central Texas territory so long he has become an institution. He is widely known in organization circles as one of the directors of the Texas division of the Mid-Continent Oil & Gas Association in addition to his activities among the various producing groups. The accompanying snapshot was taken at the Rivercrest country club, Fort Worth.

* * *

Officers for 1928 of the Ardmore, Okla., Geological Society are Charles E. Clowe, president; A. M. Meyers, vice president; George E. Burton, secretary-treasurer. A program committee consists of C. W. Wheeler, Sam Woods and George E. Burton.

* * *

Harold Jones of Fort Worth, general manager of the Ed F. Buckley interests in Texas, has returned home after a trip to Tampico. He formerly lived in Mexico.

A monument costing about $25,000 will soon mark the location where Capt. A. F. Lucas drilled the discovery well of the Spindletop field in 1901. Oil interests and private citizens subscribed the money necessary to erect the tribute to the veteran wildcatter whose caprock discovery south of Beaumont put the first Gulf Coastal salt dome on oil production. G. Frank Myers, director of the monument campaign, will see that the exact location of the Lucas "gusher" is the site of the monument.

* * *

Oscar Sutro and M. E. Lombardi, directors of the Standard Oil Co. of California, have returned to San Francisco headquarters after an extended Texas trip. Mr. Sutro is legal counsel for the Standard and Mr. Lombardi is in charge of northern California field operations. In addition, Mr. Lombardi is vice president of the California Co., Rocky Mountain and Texas producing subsidiary of the Standard of California.

* * *

Herman J. Owen, geologist, of the Ohio Oil Co., who makes personal headquarters at Owensboro, Ky., is engaged in general reconnaisance work in northeastern Mississippi and northwestern Alabama.

* * *

Two field divisions of the Union Oil Co. of California have made safety records by the virtual elimination of accidents. For six months, neither the San Joaquin valley division nor the Coast Range division of the department of exploration and production has found it necessary to record a single lost-time accident. E. C. Critchlow is in charge of the Coast division and Charlie Woods is superintendent of the San Joaquin territory.

* * *

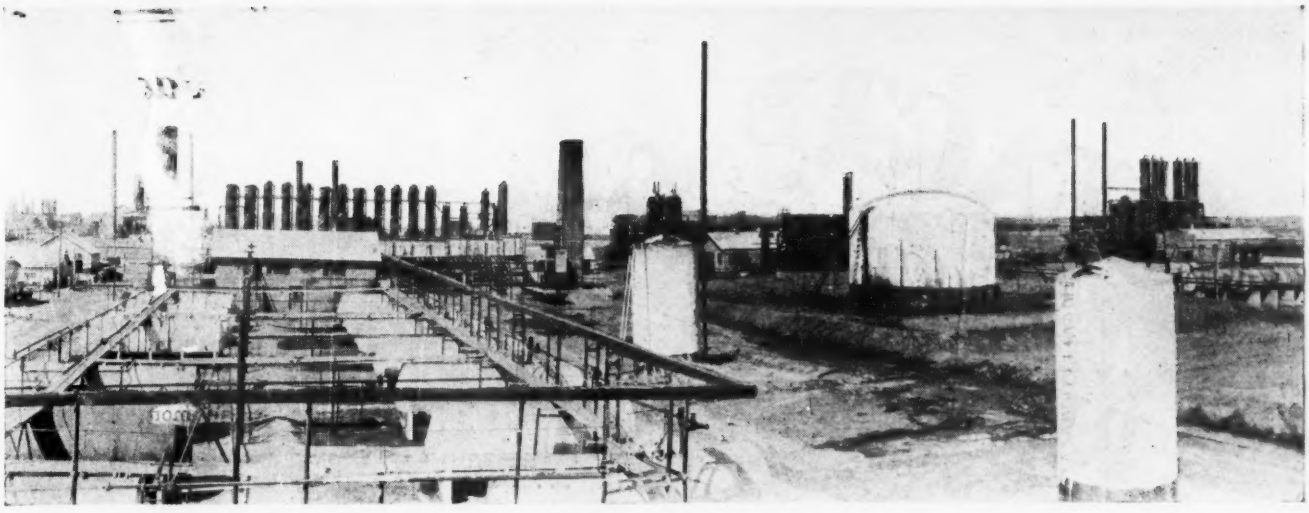
Charles Bassett, employed by the Lago Petroleum Corp., in the Maracaibo, Venezuela, district, and Miss Gladys Hawley of Tulsa were recently married. Miss Hawley was formerly in the geological department of the Silurian Oil Co.

* * *

Howard B. Pyle is now in charge of the Wichita Falls land offices of Roxana Petroleum Corp. He succeeds W. C. Davis, transferred to San Angelo. Mr. Pyle was formerly stationed in the East Texas territory.

* * *

R. Cullinan has resigned as export manager of The Texas Co., at New York, after 12 years service in the company. He was in the export department about six years.



General view of the Bolene Refining Co. plant at Enid, Okla.

Fuel Costs Halved on Old Shell Still Battery at Bolene Plant

By J. C. Chatfield
N. P. N. STAFF WRITER

ENID, Okla., April 28

FUEL costs for the crude still battery at the plant of the Bolene Refining Co. at Enid have been cut in half although the company has not gone to the expense of abandoning its old shell stills. In addition, the capacity of the plant has been stepped up until the still battery is now handling four times as much crude as it was originally designed to run.

The Bolene crude battery was built about nine years ago, before the industry had embarked on its period of rapid technical advance in fuel economy or close fractionation. There are nine 6 by 18-foot stills originally considered as 75 barrel stills which would give the battery a capacity of 675 barrels per day. The plant now runs 4000 barrels of crude per day as a usual schedule. The rerun battery of five stills has been shut down as no rerunning is necessary since the installation of bubble towers.

To obtain a greater input of heat the plant operators began their changes in the still battery by adding dutch ovens to provide a greater flame travel. The individual steel stacks behind the stills have been removed and the combustion gases are introduced into a common duct leading to two brick stacks.

As illustrated in an accompanying photograph, each of the stacks was provided with an extended series of coils through which a part of the crude charge is pumped to absorb heat from the flue gas. The crude passes across the stack four times at each level. In the north stack there are 19 series of coils and in the south stack 27 series so that in one stack the crude makes 76 passes through the flue and in the other 108 passes.

In addition to the stack coils the operators have installed a series of coils in the hot gas duct leading from the combustion chambers to the stacks. The Bolene plant operates on sweet Oklahoma crude produced in the Garber district and adjacent fields so that P. G. Maranville, operating superintendent, has never been troubled with corrosion of his coils. Return bends are of welded construction and no replacements of tubes have been necessary.

A wind-break has been built enclosing the north and west exposures of the still battery which has had a marked effect in saving fuel. As illustrated, the wind-break has been built largely of old tank plates. There are numerous doors as emergency exits for the safety of stillmen in case of fire.

Raw crude for the plant is split into two streams before being charged to the stills. One stream is pumped through coils in the top of the bubble towers, passing in parallel through the entire battery. From the trim coils this part of the crude goes to the coils in the stacks.

The second part of the raw crude passes through a heat exchanger against the residuum from the No. 9 still and thence into the series of coils laid in the hot gas duct.

Both streams are then charged into a flash tower. The crude enters this tower at about 275 degrees Fahr. and due to the large content of light gasoline in the crude a fairly heavy cut of light gasoline is taken from the top of the tower. Crude from the bottom flows by gravity into the No. 1 still.

Two methods have been used to build up the capacity of the battery, both affecting the transfer rate. Large transfer lines are used to speed up the flow by gravity, and two Gardner hot oil pumps have been installed.

ONE of the hot oil pumps pulls oil from the bottom of the No. 6 still and charges it into the bubble tower over the No. 7 still. This oil flows by gravity from the bottom of the tower into that still and into the No. 8 still.

A second pump pulls the hot oil from the bottom of the No. 8 still and discharges it into the bubble tower over the No. 9 still. By discharging the oil over the No. 7 and No. 9 towers a more complete distillation is obtained. The oil also aids in trimming the towers.

Since the installation of a Jenkins cracking plant the crude battery has been used for taking only gasoline and kerosene overhead. Gasoline streams ordinarily are taken from the flash towers and from the first seven stills. The eighth still may be arranged to cut either a heavy naphtha or a light kerosene and the ninth still yields kerosene.

The residuum from the crude battery is pumped to a small pipe still

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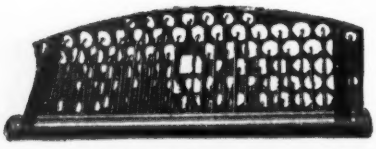

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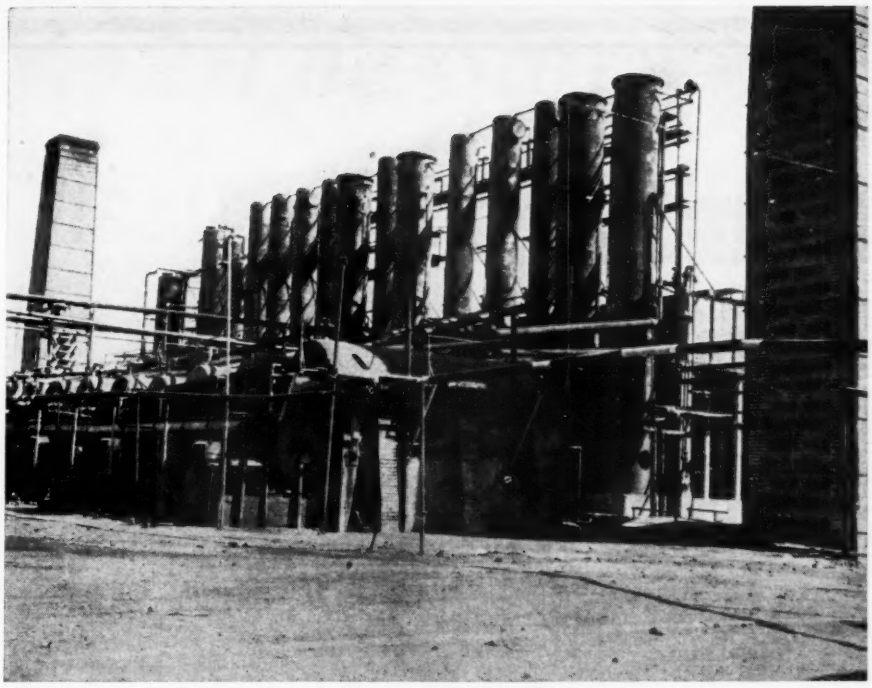


Crude battery at Bolene plant consisting of nine 6 by 18 foot stills which are running 4,000 barrels of light crude daily

where a cracking stock cut is taken overhead and a heavy fuel oil as residuum.

At the present time the Jenkins plant is shut down on account of market conditions. The idle time is being taken advantage of to make a number of changes. Heat exchangers are being added to the system to rob the recycle gas oil of its excess heat as it is withdrawn from the towers.

A recent addition to the cracking plant has been a flush-back arrangement connected with the residuum draw-off line calculated to increase the length of run. The device was first put into use at the plant of the Bartles-Maguire Oil Co. at East Chicago. There the operating cycle was increased to as much as 42 days as compared with a normal 30-day cycle.

In the Jenkins cracking unit residuum is drawn off continuously from the upper drum through which the cracking stock is circulated from the furnace tubes. A perforated line is inserted in the drum through which the residuum is drawn off.

With the flush-back arrangement it is possible to pump oil back through the draw-off line to clear away accumulations of carbon and then flush out the coke while it is in suspension in the oil. The fittings necessary for the flush-back are illustrated in an accompanying photograph taken at the Bolene plant. At this plant all forged steel fittings and valves are used.

ONCE every 24 hours the residuum draw-off line is closed and recycle gas oil is pumped into the drum against the operating pressure. In the pump-in line are two valves with a check valve between. The pump is operated only about 5 minutes to flush the soft, powder like coke away from the perforations in the draw-off line.

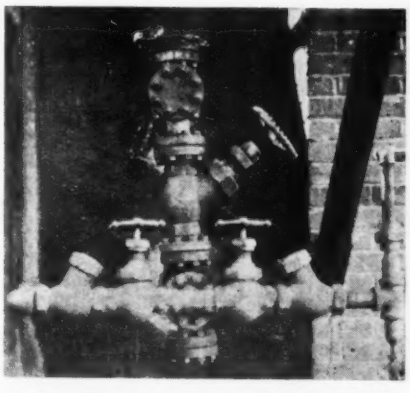
After the unit has been on stream about an hour and a half in the usual manner the draw-off valve is opened wide and the still is allowed to blow down for about 2 minutes. In the hour and a half interval between the time when the gas oil is pumped into the still and the still is blown down the carbon begins to settle back down around the perforated pipe. When the valve is opened this soft carbon is blown out.

THE Bolene cracking plant is equipped with Gray towers for treating the gasoline for color stability.

L. C. Florence, superintendent in charge of construction at the Bolene plant, keeps a skilled welder on his staff and has found it possible to reduce construction costs considerably by using him liberally. Second hand pipe and railroad iron are used about the plant instead of structural steel when there is any building to be done.

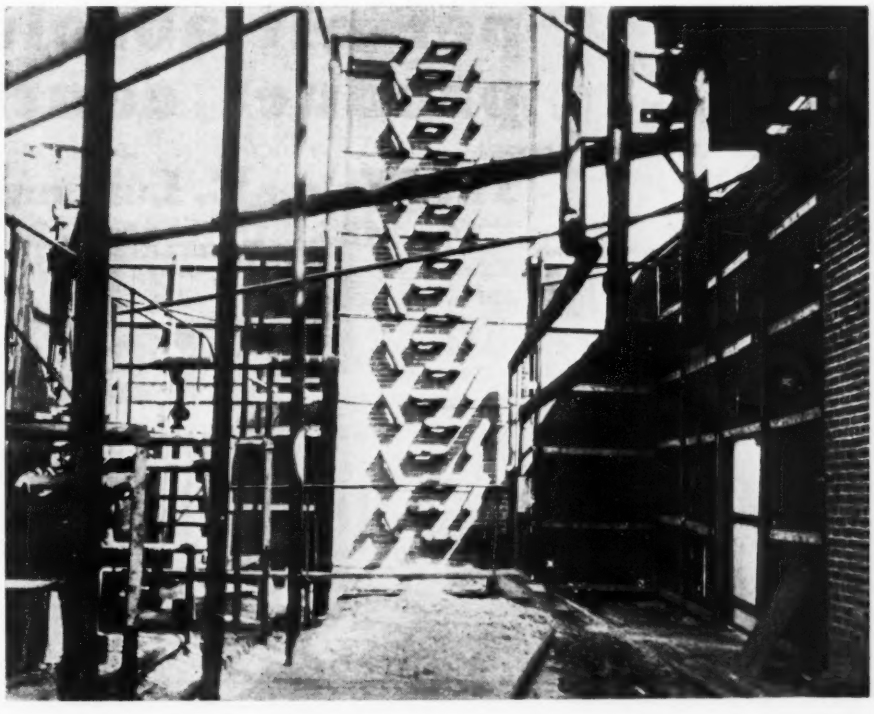
For example the Gray towers are mounted on supports made of welded pipe and railroad iron. The windbreak around the crude battery is attached to pipe uprights held in place by cross members of welded old two inch pipe. The loading rack is built almost entirely of welded pipe, wood being used only for the floor of the walkways and steps.

To reduce refining and storage losses the plant has been equipped with a Braun absorption plant which picks up gasoline vapors from all parts of the refinery.



Valve arrangement on Jenkins cracking still by means of which carbon accumulations are blown down daily and the operating cycle increased

View inside wind break around north end of Bolene's still battery showing arrangement of crude heating coils in stack



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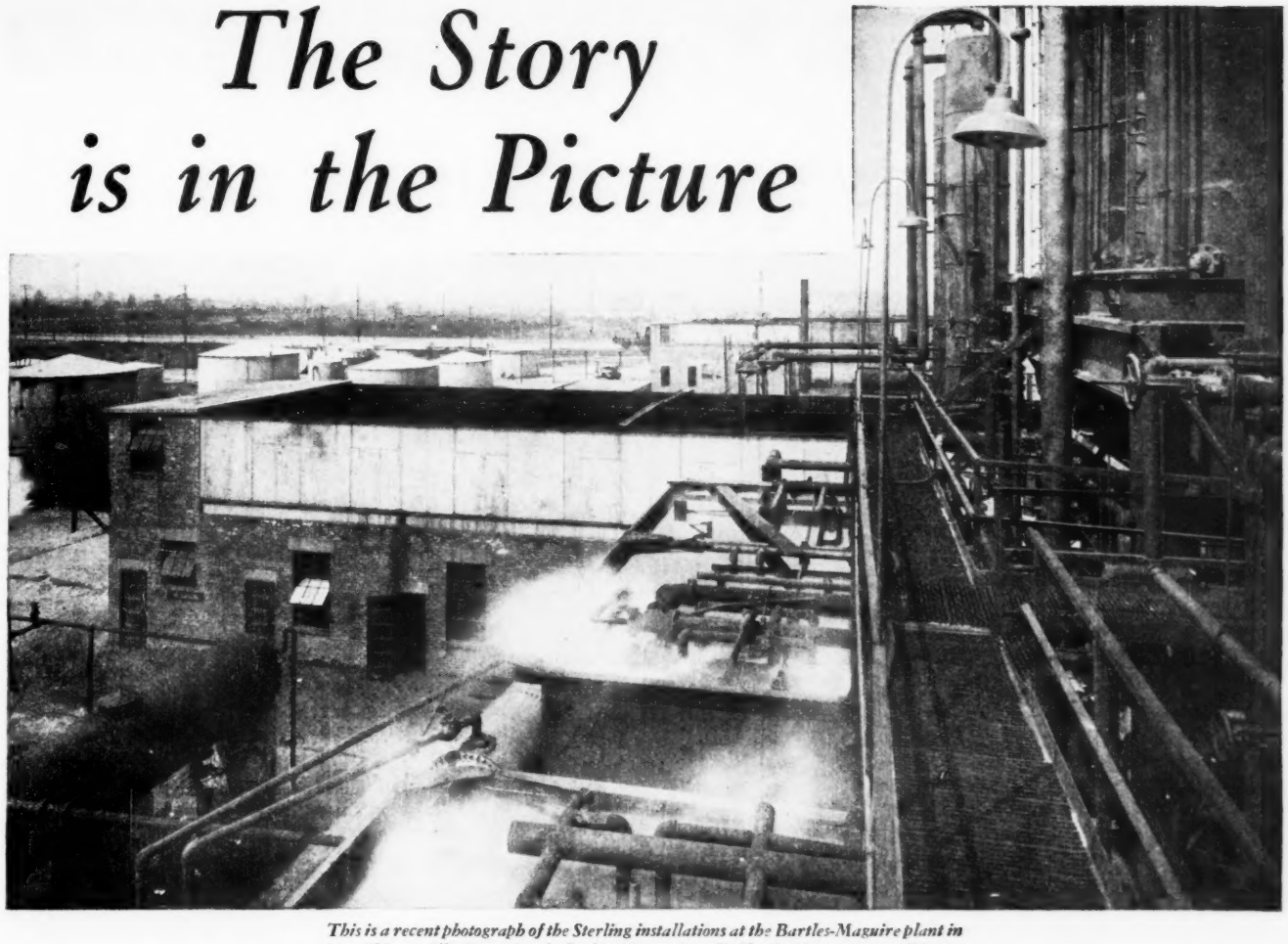

This is a recent photograph of the Sterling installations at the Bartles-Maguire plant in East Chicago Ill. Operating the Jenkins Process installed by the Graver Corp., Chicago.

IN THE above photograph notice the size of the abandoned condenser box in the background. This box which was equipped with old-style condensing surface, handled daily the condensates of an average run of only 1000 bbls. of cracking stock. The three small boxes—in the foreground—equipped with easily accessible STERLING Sections represent half the volume of the old box—yet they handle daily the condensates from 2000 bbls. of cracking stock.

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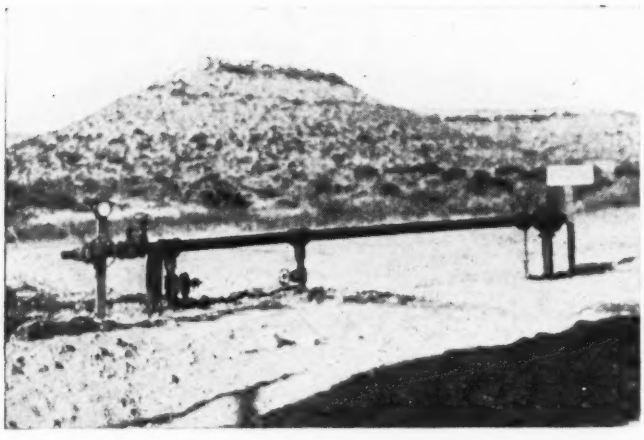
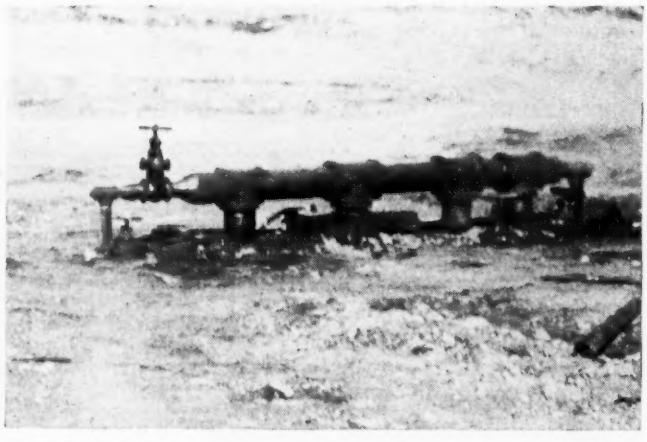
Control-Heads Peeping Out of Ground Identify Yates Field Wells



Type of well connections used by Humble Oil & Refining Co. in Yates field



Mid-Kansas Oil & Gas Co. typical Yates field well-head connections with master gate buried below ground level

By Paul Wagner
N. P. N. STAFF WRITER

AFTER mentally toying with the amazing landscape of the Yates field, Pecos county, and attempting to grasp the magnitude of its estimated 500,000,000 barrels ultimate yield, there creeps into the mind of the visitor to this part of west Texas a sort of bewilderment. He knows there is something lacking, but he is apt to cudgel his brain for the answer; it is such an unheard of thing.

Finally, realization dawns. There are few derricks standing, except at drilling wells, and only the control-head connections peeping out through the surface give clews to completion after completion that gaged from 100 to 1000 barrels, or even more on 1-hour tests of open flow capacities. One must look close to find them, and drive up or down over canyon trails to reach their sites.

Having remembered that the wells are only 925 to 1695 feet deep, according to surface elevation, the visitor recalls that a majority of them were drilled with portable rigs; all of them could have been. Then he gives himself a mental "black mark" for his stupidity. Of course, there is something lacking, to-wit, upwards of a hundred towering derricks that in most any other field would be spotting the landscape.

But for its name and number there is nothing about C-2—perhaps the most interesting of the field's completions to give the uninformed any evidence that the well tested at the rate of more than 65,000 barrels daily on a 1-hour gage when first brought in. Its well-head connections, though strong, consist of simple equipment. They are protected only by two strands of barbed wire strung on four iron posts, forming an enclosure; few other wells in the field have even that.

The connections at C-2 are in the form of the favorable arrangement of Mid-Kansas Oil & Gas Co., which operates for the joint account of itself and the Transcontinental Oil Co. in Yates field. A 6-inch tee, bull-headed, comes off the master gate and from one side goes to a manifold having two more 6-inch tees with connections swedged to 2½-inch flow lines; on the right, another connection is similarly swedged. This arrangement gives three outlets from the well to lease tankage.

A SIMILAR Mid-Kansas hook-up has the master gate buried below the surface of the ground, and the volume of oil produced and the pressure held at the well-head are controlled by flow nipples, or small lines direct from the wells to the traps, resulting in various arrangements of equipment by the different operators.

McMan Oil & Gas Co., operating for the joint account of itself and Marland Oil Co. of Texas, uses another hook-up. In this arrangement, a 6-inch flow line from the well is swedged to a 4-inch connection; and a double by-pass with choker in either by-pass is built in the 4-inch flow line. By this method the 4-inch flow line can be used direct or the oil by-passed through either, or both, of the choke nipples. The by-pass in this particular installation consists of 2-inch pipe.

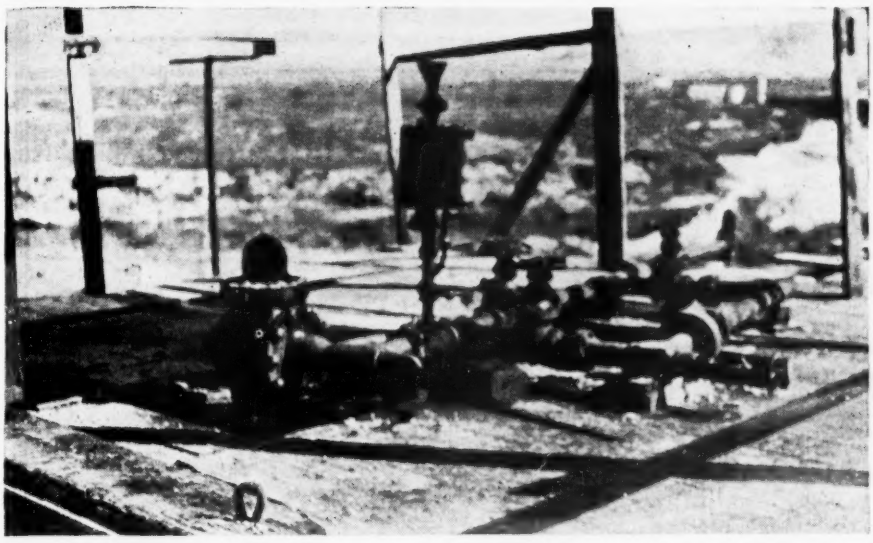
A steel cross with 4-inch outlets, placed between the master gate and the control head, is favored by Simms Oil Co. for its hook-up. Other operators use a control head above the master gate and run lines from the control head to the separator.

Another hook-up is used by Humble Oil & Refining Co. Two 4-inch lines come off a 6-inch line connected to the well-head. A pressure recording gage is connected to the 6-inch flow line.

The hook-up, on the A-1 well of Marland Oil Co. of Texas, is similar to the arrangement of equipment made by McMan Oil & Gas Co., except that the by-pass consists of a single instead of double installation and a Tret-O-Lizer is mounted in front of it for handling cut oil. Instead of a choke nipple the Marland installation utilizes a Shaffer flow-bean to regulate the output from the well. A regulation derrick, with which the well was completed, is still standing over the hole, an unusual condition in the Yates field.

VARIOUS types of flow nipples are used by the different operators, but as previously pointed out in NATIONAL PETROLEUM NEWS (Dec. 21, 1927 issue) that which is made in the form of a Venturi tube is considered probably the best. This is due to its being adjustable, it being possible to change the size of the opening without disturbing the oil flow; also there is less tendency to emulsify the oil than would be the case in using a straight-faced flow nipple.

Where treating has been necessary, as in the case of the Marland A-1 well, satisfactory results have resulted from injecting Tret-O-Lite into the flow line by means of a lubri-



Single by-pass installation and Tret-O-Lizer at A-1 Yates well of Marland Oil Co. of Texas near east edge of Pecos County field

cator before the fluid reaches the flow nipple. The resulting intimate mixture of oil, water and Tret-O-Lite at the choke increases the time in which chemical action takes place.

Use of Tret-O-Lite has not only resulted in satisfactory breaking down of emulsions in crude from west Texas fields, but it also helps to drop free water out of the oil where it occurs. Heat is not required to hasten action of the chemical and the oil being treated with chemical in the Yates field is handled cold. Heat, however, may be necessary in the colder months of the year. The open winter so far and the absence of Yates field emulsion, except in a relatively few edge wells, have prevented this problem becoming of great importance as yet.

By-pass arrangement used by McMan Oil & Gas Co. as part of well-head connection equipment in the Yates Field

BACK pressure has been used in cutting down the encroachment of water in edge wells, such as the Marland A-1 Yates, the Gulf Production Co.'s No. 1 Thompson, across the Pecos river in sec. 71, I&GN block 1, Crockett county, and others.

It was found in dealing with such wells that an increase of back pressure cuts down the inflow of water when they first start making a small quantity; but as water content increases the back pressure has less effect.

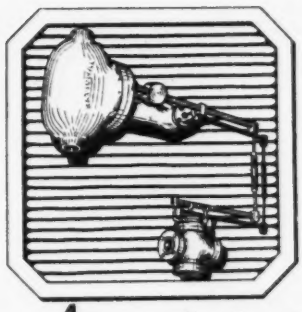
The opening of wells after water encroachment has increased the velocity of the flow tends to pick up oil surrounding the cone of water, carrying it to the surface and preventing an increase temporarily in the quantity of water. Continuance of such a practice, however, would soon bring about the type of encroachment that would result in a well producing nothing but water.

Oil, Gas Power Meet for A. S. M. E.

NEW YORK, April 30.—The first national meeting of the oil and gas power division of the American Society of Mechanical Engineers will be held June 14, 15 and 16 at State College, Pa., in conjunction with the second annual oil power conference of the Pennsylvania State College.

An unusual technical program is planned, with the Diesel engine getting most of the attention.

Among the speakers will be G. H. Michler, Standard Oil Co. of New York, who will present a statement on Diesel fuel oil specifications. This will be followed by a discussion by representatives of the American Petroleum Institute and Gulf Refining Co., among others.



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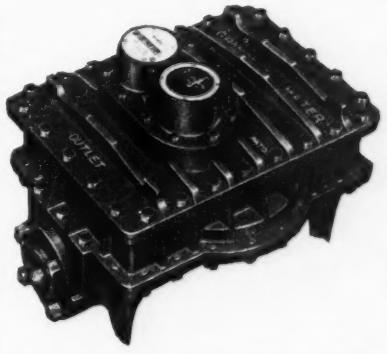

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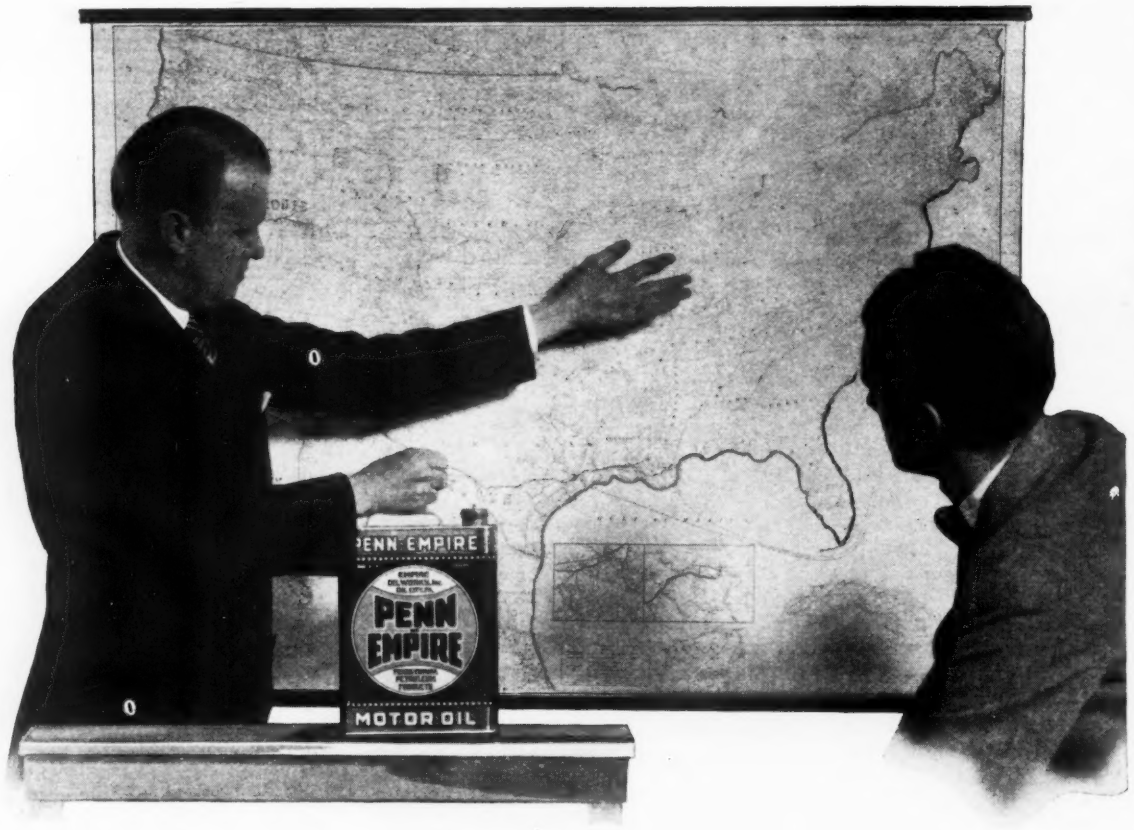

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Visiting Around the Refineries

By Paul Truesdell

National Petroleum News

Increased Gasoline Yield 2.35 Per Cent

THE TEXAS CO. in 1927 recovered 2.35 per cent more gasoline from every barrel of crude run through its refineries than it obtained in 1926, according to the company's annual statement published in The Texaco Star. The average recovery of gasoline from the crude from all the company's refineries last year was 46.73 per cent, notwithstanding that nearly 30 per cent of the crude run was of heavy grades containing little gasoline.

The company ran 38,466,947 barrels of crude in 1927, compared with 36,238,063 barrels in 1926 and made 18,528,887 barrels of gasoline compared with 16,293,214 barrels in 1926. The company installed 22 Holmes-Manley cracking units in 1927, eighteen at Port Arthur, two at the Dallas plant and two at the Tulsa plant. The total at the end of the year was 102.

The increased yield of gasoline from the crude is indicative of the manner in which the refining art is being advanced. Also, it shows the possibilities of high yields through skilled operation from the cheap heavy crudes which refiners a few years ago thought were non-refinable.

Describing Manufacture of Bright Stock

H. L. SMITH, assistant superintendent of the Muskogee, Okla., refinery of the Pure Oil Co., has an interesting article in the April issue of Pure Oil News in which he traces the steps taken in the manufacture of bright stock at the plant, illustrated by a flow chart. G. A. McBride is superintendent of the refinery.

The same issue of the Pure Oil News states that the refinery construction end of the engineering department now consists of 45 members, most of whom are engaged in work on the Gyro process, the Pure Oil Co. vapor phase cracking process that has been described earlier in NATIONAL PETROLEUM NEWS.

How About the New Motor Oils?

WHENEVER two or three refiners got their heads together at Cambridge Springs, talk was likely to turn on the new notions about motor oil that are developing as the automobile manufacturers turn out better and at the same time more exacting cars. There is much talk about vacuum distillation; about the completely dewaxed oil being made by the Texas Pacific Coal & Oil Co. at Fort Worth which was described in this paper*. Also considerable curiosity was shown in the sulfur dioxide method being used by the Associated Oil Co. in California in refining motor oil. Not much detailed information is available on these processes.

It seems that here is a fertile field in which much work will be done. For a while, though, or until the highway system of the country is changed to permit much higher speeds for long periods than are now possible, the refiners can keep up well enough with the demands of the automobile, provided they and the automotive engineers work together tolerantly for the best interests jointly of the motorist and the refiner.

*N. P. N. Feb. 8, 1928 issue, page 22.

Refining Costs in Big and Small Plants

H. S. BELL, in a paper delivered before the National Petroleum Association at Cambridge Springs last week, stated his opinion that there is a pretty definite limit beyond which the overhead costs of a refinery grow instead of diminishing as the plant expands. This is contrary to the views held by some, but it would seem that it must be shared by some of the largest companies that are building scattered small plants, instead of concentrating operations in a few large ones.

For skimming and cracking plants, Mr. Bell said, the divisor, or volume of crude run has a decided effect up to about 5000 barrels. From 5000 barrels up the effect diminishes until 10,000-barrel size is reached. From 10,000 barrels to 20,000 barrels he thinks the divisor has no effect and above 20,000 barrels the effect is unfavorable, because of necessary departmentalization, division of responsibility and distance between the operating man and his superior.

In lubricating oil refineries, Mr. Bell thinks that 1000-barrel daily capacity is near the limit of volume which shows economy over smaller scale operations. All this is encouraging to the Pennsylvania refiners whose crude runs are small compared with plants in many districts.

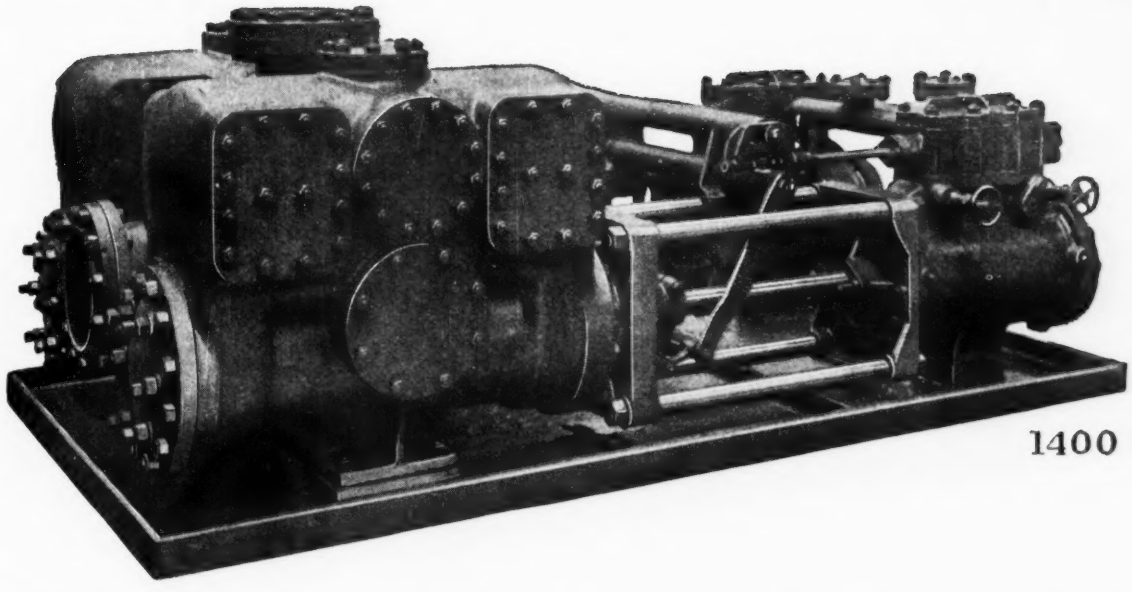
Mr. Bell also gave a few words of counsel pertaining to the marketing end as follows:

"The big company is interested in large volume distribution of goods of standard specifications and it is folly for the small refiner to meet him here."

He thinks the smaller refiner has two chances to make money in competition with the larger organizations. The first is to keep out of competition with standard specifications and make special products for which the plant can get a long price. This the big companies generally cannot do. The second is to push quality lubricating oils, possibly by building up his own branded line and selling direct to garage and filling station trade.

Mr. Bell mentions large storage capacity, which permits the holding of products for a better market, one of the advantages the big company has over the little one. This, however, is a doubtful advantage. It is a question whether more money has not been lost by holding for a better market that never came than has been made by selling products on the spot market, especially during the past two or three years. Present-day thought is that it is better to make less goods if the market is low, rather than go on making them and running them to storage.

TRANSIT
Pumping Out Pumps



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Roster of Oil Associations

National Petroleum News

American Association of Petroleum Geologists, Business Manager, J. P. D. Hull, Box 1852, Tulsa, Okla.

American Chemical Society, Petroleum Division, Mellon Institute, Pittsburgh, Pa. J. B. Hill, Atlantic Refining Co., 3144 Passyunk Ave., Philadelphia, Pa.

American Gas Association, Graybar Bldg., 420 Lexington Ave., New York City. Secretary Alexander Forward.

American Institute of Mining and Metallurgical Engineers, Petroleum Division. 29 West 39th St., New York. Chairman, Petroleum Section, F. Julius Fohs.

American Oil Burner Association, 350 Madison Ave., New York City. Executive Secretary, Leod D. Becker.

American Oil Chemist Society, 705 Tchoupitoulas St., New Orleans, La. Secretary-Treasurer, J. C. Helm.

American Oil Men's Association, 624 South Michigan Ave., Chicago, Ill. James A. Gilmore, Secretary.

American Petroleum Institute, 250 Park Ave., New York City. Secretary, R. L. Welch.

American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Secretary-Treasurer, C. L. Warwick.

Arkansas Petroleum Club, Secretary, James P. Lavery, Petroleum Supply Co., El Dorado, Ark.

Arkansas-Tennessee Oil Marketers Association, Secretary, R. E. McKellar, care Diamond Oil Co., Memphis, Tenn.

Association of Oil Jobbers of Mississippi, Jackson, Miss. President, R. C. Clark, Independent Oil Co., Tupelo, Miss.

Association of Natural Gas Supply Men, Inc., 905 Oliver Bldg., Pittsburgh, Pa. Secretary, Guy F. Batchelor.

Association of Producers of Petroleum in Mexico, 17 Battery Place, New York. Director, Guy Stevens.

Association of Producers of Petroleum in Venezuela, 17 Battery Place, New York City. Director, Guy Stevens.

California Natural Gasoline Association, Los Angeles, Calif. Secretary, Paul D. Barton, 701 S. Palm Ave., Alhambra, Calif.

Chamber of Mines & Oils of California, Chamber of Commerce Bldg., Los Angeles, Calif.

Cincinnati Oil Club. Secretary, F. H. Dinkelmann, Eureka Oil Co., Cincinnati, O.

Detroit Petroleum Club. Secretary, Frank McSweeney, Cities Service Oil Co., General Motors Bldg., Detroit, Mich.

Eastern Kentucky Oil Producers Association, Ashland, Ky. Secretary, David Browning.

El Paso Petroleum Club. President, A. L. Behringer, Home Oil Co., El Paso, Tex.

Fire and Safety Marshals of the National Petroleum Association. Secretary, S. R. Brown, Mutual Refining Co., Warren, Pa.

Georgia-Alabama Independent Petroleum Marketers Association. Secretary-Treasurer, W. L. Moore, Wofford Oil Co. of Georgia, Atlanta, Ga.

Georgia Independent Oil Marketers Association. Secretary-treasurer, J. K. Ezell, American Oil Pump & Tank Co., P. O. Box 982, Atlanta, Ga.

Greater Chicago Oil Men's Club. Secretary, Mel Keim, Apex Motor Fuel Co., 4555 W. 26th St., Chicago, Ill.

Gulf Coast Independent Oil Producers Association, 403 Goggan Bldg., Houston, Tex. Secretary, T. L. Smith, Jr.

Illinois Petroleum Marketers Association. Secretary, G. A. Primm, Chamber of Commerce Bldg., Springfield, Ill.

Independent Oil Men of America, 624 S. Michigan Ave., Chicago, Ill. Lou Harrington, Resident Manager.

Independent Oil Men's Association of Massachusetts. Secretary, F. E. Bergfors, care Quincy Oil Co., Quincy Adams, Mass.

Independent Oil Men's Association of New England. Secretary, I. H. Farrar, Berkshire Oil Co., Worcester, Mass.

Independent Petroleum Marketers of Middle Atlantic States. President, R. C. Paul, Harrisburg Oil & Supply Co., Cameron & Paxton Sts., Harrisburg, Pa.

Indiana Independent Petroleum Marketers Association. Field Secretary, Sam T. Hurd, Hotel Severin, Room 306, Indianapolis, Ind.

Iowa Independent Oil Men's Association, 225 Fifth St., Des Moines, Ia. Secretary, M. L. Long.

Kansas Oil Men's Association, 423 First National Bank Bldg., Wichita, Kan. Secretary, J. A. Motter.

Kentucky Oil Men's Association, Inc., 610 Trust Co. Bldg., Lexington, Ky. Secretary, Thomas S. Scott.

Kentucky Petroleum Marketers Association, 3401 Bank St., Louisville, Ky. Secretary, L. J. Connelly.

Maine Independent Oil Dealers Association. President, Theodore E. Emery, president, Kennebec Oil Co., Augusta, Me.

Michigan Independent Oil Men's Association, 1005 Grand Rapids National Bank Bldg., Grand Rapids, Mich. Secretary and Treasurer, Wayne C. Hughes.

Mid-Continent Oil & Gas Association, 308 Tulsa Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Kansas-Oklahoma Division, 308 Tulsa Bldg., Tulsa, Okla. Secretary, Harry H. Smith.
Louisiana-Arkansas Division, American National Bank Bldg., Shreveport, La. Secretary, Joseph B. Elam.
Texas Division, Kirby Bldg., Dallas, Texas. Secretary, J. P. Laney.

Minnesota Petroleum Association, 638 Builders Exchange, Minneapolis, Minn. Secretary, Paul E. Hadlick.

Mississippi Oil Men's Association. Secretary, J. J. McEwen, 501 Capital National Bank Bldg., Jackson, Miss.

Missouri Oil Men's Association, 217 Dwight Bldg., Kansas City, Mo. Secretary, George S. Allee.

National Association of Independent Oil Producers, 414-419 Ritz Bldg., Tulsa, Okla. President, William H. Gray.

National Gasoline Dealers Association, Inc., 280 Madison Ave., New York City. Secretary, Thomas P. McKee, Jr.

National Petroleum Association, Munsey Bldg., Washington, D. C. Washington Counsel, Fayette B. Dow.

Natural Gas Association of America, 905 Oliver Bldg., Pittsburgh, Pa. Secretary, Guy F. Batchelor.

Natural Gas & Petroleum Association of Canada, Chatham, Ont., Canada. Secretary, S. A. Morse.

Natural Gasoline Association of America, 305 Tulsa Bldg., Tulsa, Okla. Secretary, A. V. Bourque.

Nebraska Independent Oil Men's Association, 816-817 Terminal Bldg., Lincoln, Neb. Secretary, C. M. Sutherland.

New Jersey Oil Trade Association, 196 Halsey St., Newark, N. J. Secretary, J. H. Chambers.

New York State Oil Producers Association, Wellsville, N. Y. President, Lewis H. Thornton.

New York State Petroleum Marketers Association, 1201 So. Salina St., Syracuse, N. Y. Secretary, Benjamin A. Javitz.

North Carolina Independent Oil Jobbers Association, Greensboro, N. C. Secretary-Treasurer, L. H. Martin, L. H. Martin, Inc., Greensboro, N. C.

North Central Ohio Petroleum Club, 489 Cherry St., Marion, O.

North Dakota Petroleum Association. Acting head, H. M. Wilson, care International Oil Co., Minot, N. D.

Northwest Independent Oil Association. Secretary, C. H. Brown, care Arro Oil & Refining Co., Lewiston, Mont.

Northwestern Pennsylvania Oil Producers Association, 78 Main St., Bradford, Pa. President, A. Edward Booth.

Ohio Gas & Oil Men's Association, 811 First National Bank Bldg., Columbus, O. Secretary, William H. Thompson.

Ohio Petroleum Marketers Association, 606 Commerce Bldg., Columbus, O. Executive Secretary, W. A. Milne.

Oil Trade Association of Baltimore, Md. Secretary, Arthur B. Gardner, 309 East Falls Ave., Baltimore, Md.

Oil Trade Association of Philadelphia, Inc. Secretary, Howard M. Rogers, 123 Arch St., Philadelphia, Pa.

Oil Trades Association of New York City, Inc., 35 So. William St., New York City. Secretary, Joseph C. Smith.

Oklahoma Oil Jobbers Association, 416 Fidelity National Bank Bldg., Oklahoma City, Okla. Manager, Secretary and Treasurer, Arthur J. McClelland.

Oklahoma Oil Marketers, Inc., P. O. Box 755, Enid, Okla. Secretary, W. W. Blackburne.

Okmulgee District Oil & Gas Association, Okmulgee, Okla. Secretary, Charles I. O'Neill.

Osage Oil & Gas Lessees Association, 505 Cosden Bldg., Tulsa, Okla. Secretary, Harry H. Smith.

Pennsylvania Grade Crude Oil Association, 209 Chambers Bldg., Oil City, Pa. Secretary, R. J. Alexander.

Petroleum Club of Central New York. Secretary, George R. Casey, Crown Oil Co., Syracuse, N. Y.

Petroleum Independent Electrical Association. Secretary, H. E. Browne, Prairie Pipe Line Co., Independence, Kans.

Petroleum Motor Transport Association. President, Roy F. Fike, Mid-Continent Petroleum Corp., Cosden Bldg., Tulsa, Okla.

Pierce County Independent Gasoline & Oil Dealers Association. Executive Secretary, J. H. Stine, 1009½ Pacific Ave., Tacoma, Wash.

Purchasing Agents Association of Tulsa, 307 So. Cincinnati St., Tulsa, Okla. Secretary-treasurer, H. M. Cosgrove.

Rocky Mountain Independent Oil Men's Association (formerly Colorado Petroleum Club), 411 Exchange Bldg., Denver, Colo. Secretary, A. Oberholtz, Jr.

Rocky Mountain Oil & Gas Association, P. O. Box 1559, Casper, Wyo. Secretary, C. W. Sparr.

Rocky Mountain Oil & Gas Association, Montana Chapter, 222 Ford Bldg., Great Falls, Mont. Secretary, Walter F. Brittan.

South Dakota Independent Oil Jobbers Association, Sioux Falls, S. D. Secretary, F. H. Buehler, care Dacotah Oil Co., Madison, S. D.

Southeastern Missouri Oil Marketers Association. Secretary, E. C. Smith, Kelso Oil Co., Cape Girardeau, Mo.

Southeastern Ohio Oil & Gas Producers Association, Logan O. Secretary, W. L. Franks.

Southern Petroleum Jobbers Association. Secretary, D. C. Patterson, Camden, S. C.

St. Louis Petroleum Club, 1430 So. Vandeventer Ave., St. Louis, Mo. Secretary, R. F. Leinberger, Blackmer Pump Co., St. Louis, Mo.

Springfield Petroleum Club, Secretary, Ross Lock, c/o Lock Bros., Oil Co., Springfield, Ill.

State Executives Club. Secretary, Paul E. Hadlick, Minnesota Petroleum Association, 638 Builders Exchange, Minneapolis, Minn.

Tank Car Association, 1015, 139 N. Clark St., Chicago, Ill. Manager, J. Arthur Kealy.

Technical Club of Oklahoma, 208 Fisher Bldg., Tulsa, Okla. Secretary, R. I. Ginter.

Tennessee Independent Oil Men's Association. Secretary, G. H. Alsup, Jr., care Consumers' Supply Co., Murfreesboro, Tenn.

Texas Independent Oil Men's Association. Secretary, L. A. Greene, care Radio Petroleum Co., Forth Worth, Tex.

Virginia Independent Oil Men's Association, 511 Union Trust Bldg., Petersburg, Va. Secretary-treasurer, M. B. Whiting, Whiting Oil Co., Clifton Forge, Va.

West Virginia Oil and Natural Gas Association, Fairmont, W. Va. Secretary-Treasurer, Edwin Robinson.

West Virginia Oil Marketers Association, 513 Peoples Exchange Bank, Charleston, W. Va. Secretary and Treasurer, D. E. Frierson.

Western Petroleum Refiners Association, 504 Cosden Bldg., Tulsa, Okla. Managing Director, Howard Bennette.

Western Reserve Petroleum Club. President, R. C. Heil, Commercial Oil Co., 2545 E. 83rd St., Cleveland, O.

Wisconsin Independent Oil Jobbers Association. Secretary, J. M. McLaughlin, Bartles-Maguire Oil Co., Milwaukee, Wisc.

Wyoming Petroleum Club. Secretary, G. H. O'Donnell, 847 So. Lincoln St., Casper, Wyo.

Electric Power Generated at Well Site Used in New Mexico Test

By Lawrence E. Smith
N. P. N. STAFF WRITER

PONCA CITY, April 28

FROM an ambition nursed for several years by engineers and executives of the Marland Oil Co., among others, to see a trial application of locally generated electric power for drilling has come a pioneering venture in southeast New Mexico. It is unique in form and certain to yield information not previously collected.

The use of diesel type engines running generators, and transmission of the current generated to drilling motors, is the form of transmission of power which the Marland people wanted to see tried.

Use of current for drilling has given excellent results in many instances, but it has had its limitations. Among them was the inability to get this form of power in wildcat territories. Generation of the current at the well site would solve that problem. The reason for transmitting power via generator instead of direct from engine to tools is wholly a question of flexibility.

As the experiment is now being conducted, the prime mover is not diesel type but gasoline engine, of the marine type. It is a much finer piece of equipment than is seen in the oil fields; but because the contractor, W. C. Ray, of Amarillo, was able to buy two units at a fraction of their original cost, he could begin the venture with an investment in power equipment far under that which he would have put into steam or gas engine units.

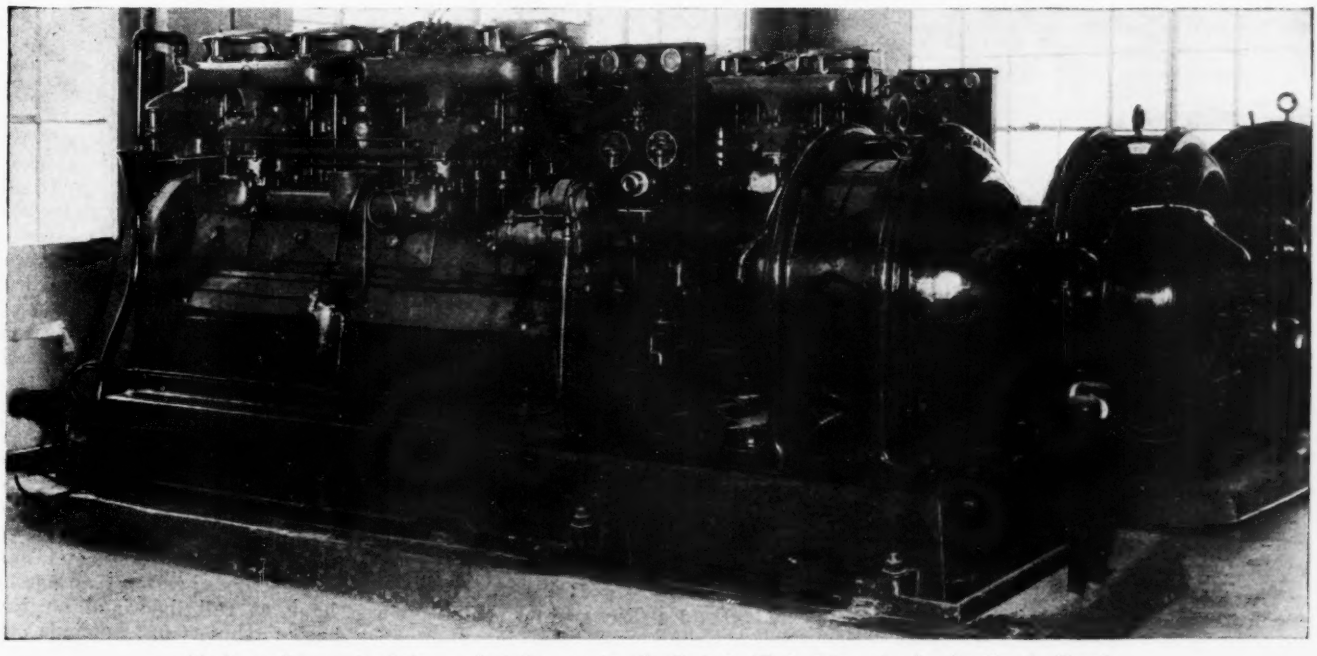
As this is written one of the two wells with this form of power hookup is drilling and the other is shortly to be started. No. 1 Seideman, in the SW of 4-25-26, Lea county, New Mexico, is the drilling well. This is about seven miles from the little town of Jal. It is a cable tool job. The country is, like west Texas fields, a difficult one from an operating standpoint. Steam drilling is out of the question because of the scarcity of water. The company has to haul by truck all water for the camps.

This is the equipment of each of the two units: An eight-cylinder Sterling gasoline engine, model G.R.C., 5¾ by 6¾, developing 190 horsepower at 5500 feet elevation. This is the type of engine that the Sterling company makes for gasoline yachts and other purposes where a uniform flow of electric power, with its attendant flexibility, is required. This engine is direct connected to a General Electric generator, type A.T.I., 112½ K.V.A., at 1.0 power factor, 440 volts, 1200 r.p.m., 60 cycle, three-phase alternater, with direct connected 125-volt exciter mounted outboard of bearing.

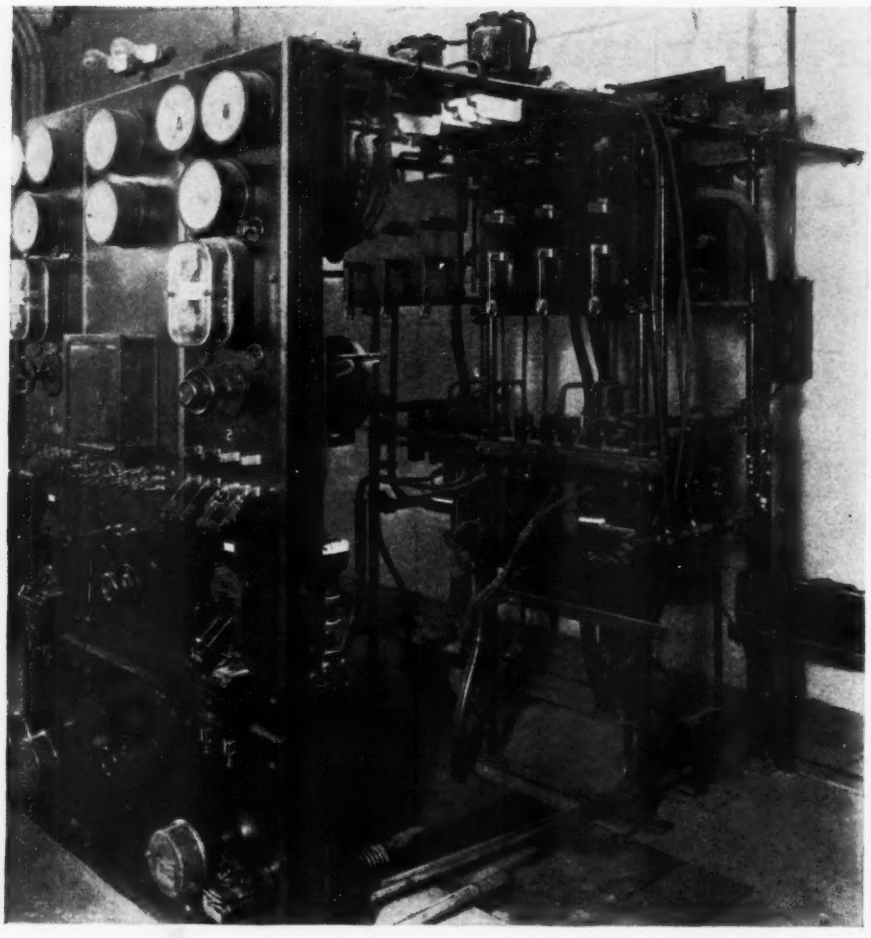
The weight of each unit is 14,000 pounds. Because of its light weight —it is not as heavy as some oil field boilers—and its low center of gravity, the units are easily moved. The two that Contractor Ray is using were trucked from Pyote, Tex., a distance of 57 miles over virgin road. Five-ton trucks handled them with no special effort. The engine and generator are on a cast-iron base and are moved as one. At the location, the unit is simply set on timbers. The overall length of engine and generator is 15 feet, height six feet and width five feet.

The current generated is transmitted to a General Electric type M.T., 75 horsepower, 900 r.p.m., 440 volt drilling motor. This type is well known in the oil industry. It has all the modern improvements and is controlled from the headache post on the derrick floor.

The switchboard used with the unit is an important part of the assemblage. It has many data recording instruments whose daily charts are being studied by Marland engineers. The slate switchboard is



Engine and generator being used at Lea county, N. M. test. Photo taken at mine location in Nevada



Switchboard with recording instruments used at Lea County, N. M. test

mounted with voltmeter, ammeter, rheostat, oil circuit breaker, overload relays, recording watt meter.

The total k.w. output can be ascertained at any time. There is also a voltage regulator which plays an important part in the uniformity of the power output. In planning the installation, engineers confess that this regulator is a thing for which they anticipated no need but they now see that it is one of the most important devices that could be added. If an extra load be thrown on the motor, it may be noticed on the engine, which will slow down slightly. The regulator immediately excites the generator to the point where the voltage remains constant.

The engine, incidentally, is governor controlled, has triple spark plug ignition and is fed by double carburetor.

On the derrick floor is an indicating ammeter, mounted on the headache post, which shows the driller what load his motor is pulling. There is also a remote control switch to start and stop a centrifugal pump which supplies water to the derrick floor. The forge house has a motor driven blower and a motor driven grinder for sharpening tools.

There is also—what is this industry coming to?—an electric toaster and percolator on the lazy bench, so that the driller and tool dresser can fix themselves up a tasty snack whenever they feel like it. The contractor plans to put in electric refrigerators right away, so as to get away from the job of hauling ice to the camps. The unit now in service supplies far more current than can be used—in fact, he could drill two wells at the same time, and probably will, if the Seideman test gets production and calls for drilling on locations near each other.

The story of how Contractor Ray became interested in being a pioneer is interesting. The two engines and generators were originally bought as stand-by units for the Comstock Merger Mines and Mills, Virginia City, Nevada. The company, which was to operate a gold concentration plant, went out of business and all its equipment was offered for sale by a Denver mining machinery supply company. Marland engineers knew the price at which the two units could be bought and Mr. Ray, who is of the type well illustrated by the saying that he will "try anything once," was enthusiastic about the idea. The units had never been used beyond merely being turned over about once a week and were in new condition.

Charles Geddes, general superintendent of development for the Marland and F. E. Richardson, chief engineer of the producing department, played principal parts in seeing that the contractor had every assistance in getting the right start. The reassembling of the equipment and the installation in the field were handled by J. A. Hudson, electrical superintendent for the company and J. D. Leonard, his assistant.

Alternating current is generated by the unit at the Seideman well, but some experimenting is to be done with direct current.

The test started for a contract depth of 4000 feet and, from the progress made, it is considered probable it will be completed in 50 days from spudding, barring accidents, which for cable tool drilling on a wildcat is quite a feat. The test started with 24-inch hole and set 280 feet of 20-inch conductor pipe. It drilled in 15½-inch hole to 780 feet, mostly through red rock formation. The drillers made 100 feet of hole the first 24 hours. At 572 feet water was found and the hole was drilled wet to 780 feet, where the 12½-inch pipe was set. It then resumed drilling in the 10-inch hole.

The average time required to drill a screw, or six feet, thus far has been 20 minutes. The drilling motion has met with the high approval of Drillers Lloyd Gilson and Merl Kirchevall. One of the peculiar facts being obtained is that the chart on power consumption shows the man who knows how to read it just where one driller went off "tower" and the other took hold. One using a different drilling motion than the other, but making the same amount of hole, will consume a little more current.

While no conclusions can be drawn at this early date from a test which is nowhere near completion—nor could the record of one well supply conclusions that would have general application—the data being recorded daily will not only be valuable in designing future power installations but will be carried into a refinement seldom if ever attempted in the past.

The record will show the total kilowatt hours generated per day per foot of actual drilling, per trip of bailer, the gasoline and oil consumption per KWH generated for each operation, the KWH consumed for different lengths and weights of pipe, the KWH consumed for ramming different sized bits in dressing them and the KWH loss through friction by reason of different types of equipment installed at the rigs, such as different types of sand reels.

Records show that the average kilowatt consumption per hour, using a 20-inch bit spudding in the third hole at depth of 200-300 feet, was 34.7 KWH. During that period the depth made was 104 feet. Fuel consumption thus far is about one pint of gasoline per brake horsepower hour at full load and on the same basis about 0.025 pounds of lubricating oil. It requires about

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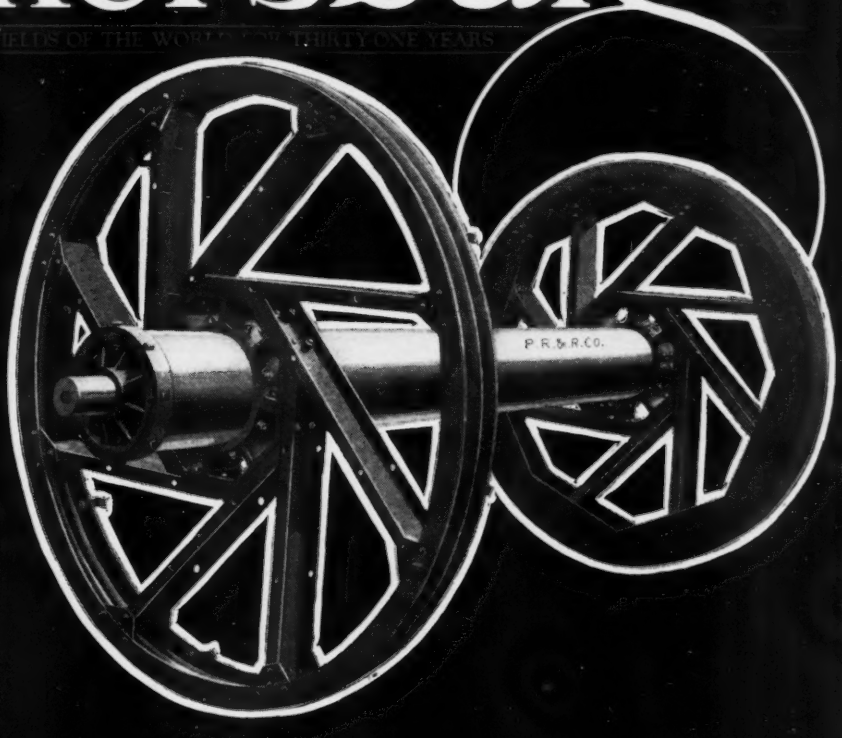

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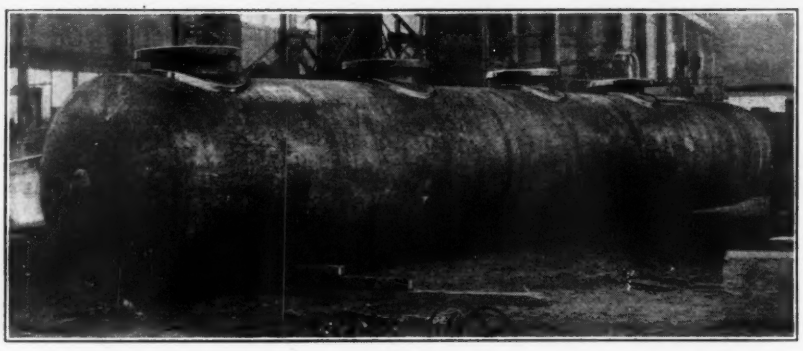
BLAW-KNOX FORGE and HAMMER WELDING



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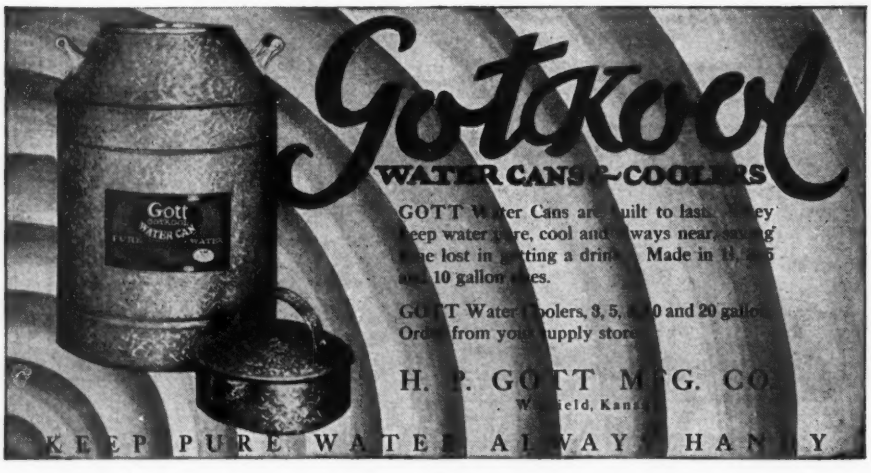


125-150 gallons of gasoline per day to run the engine.

This assemblage does not fully answer the question of the adaptability of a full diesel type engine to drilling, but it partly does. The difficulty heretofore has been that diesel type engines did not possess the portability required for oil field work. It is understood that certain manufacturers believe they have that problem solved and will soon be able to offer an engine, running on fuel oil, light enough in weight to satisfy the oil operator.

New Patents

April 17, 1928

REFINING

Process for Converting Petroleum Hydrocarbons—Walter M. Cross, Kansas City, Mo. Filed July 20, 1925. No. 1,666,119.

Process and Apparatus for Separating Gasoline from Crude Oil—Arthur E. Pew, Jr., Bryn Mawr, and Henry Thomas, Ridley Park, Pa., assignors to Sun Oil Company, Philadelphia, Pa. Filed Feb. 23, 1924. No. 1,666,300.

Process and Apparatus for Distilling Mineral Oil—Arthur E. Pew, Jr., Bryn Mawr, and Henry Thomas, Ridley Park, Pa., assignors to Sun Oil Company, Philadelphia, Pa. Filed Feb. 23, 1924. No. 1,666,301.

Process and Apparatus for Distilling Mineral Oil—Arthur E. Pew, Jr., Bryn Mawr, and Henry Thomas, Ridley Park, Pa., assignors to Sun Oil Company, Philadelphia, Pa. Filed Feb. 23, 1924. No. 1,666,302.

Method of Refining Heavy Mineral Oils by Means of Sulphur Dioxide in a Continuous Operation—Lazar Edeleanu, Karl Pfeiffer, Karl Gress, and Paul Jodeck, Berlin, Germany. Filled June 25, 1927. No. 1,666,560.

Process for Distilling Oils—Audley E. Harnsberger, Columbus, Ohio, assignor to The Pure Oil Company, Chicago, Ill. Filed Nov. 12, 1926. No. 1,666,597.

Apparatus for Removing Coke from Stills—Leroy V. Robbins, Baton Rouge, La., assignor to Standard Oil Development Company. Filed Oct. 18, 1923. No. 1,666,865.

PRODUCTION

Pump-Operating Mechanism—Edgar G. Willrich, Los Angeles, Calif. Filed Aug. 19, 1926. No. 1,666,227.

Fabricated-Derrick Construction—Clarence B. Foster, Glendale, Calif., assignor to Frederick L. Feisthamel, Arthur J. Carr and Thomas A. Collins, Los Angeles, Calif. Filed July 17, 1926. No. 1,666,413.

Fabricated Derrick—Clarence B. Foster, Glendale, Calif., assignor to Frederick L. Feisthamel, Arthur J. Carr and Thomas A. Collins, Los Angeles, Calif. Filed July 17, 1926. No. 1,666,414.

Apparatus for Sinking Oil Wells—Charles A. Lord, Los Angeles, Calif. Filed June 17, 1924. No. 1,666,461.

Combination Sucker-Rod Elevator and Spider—Dolphice H. Greenwood, Los Angeles, Calif. Filed March 1, 1926. No. 1,666,621.

Method of Flowing Gas Wells—George C. Henceroth, Independence, Kans. Filed Oct. 28, 1922. No. 1,666,779.

NATURAL GAS

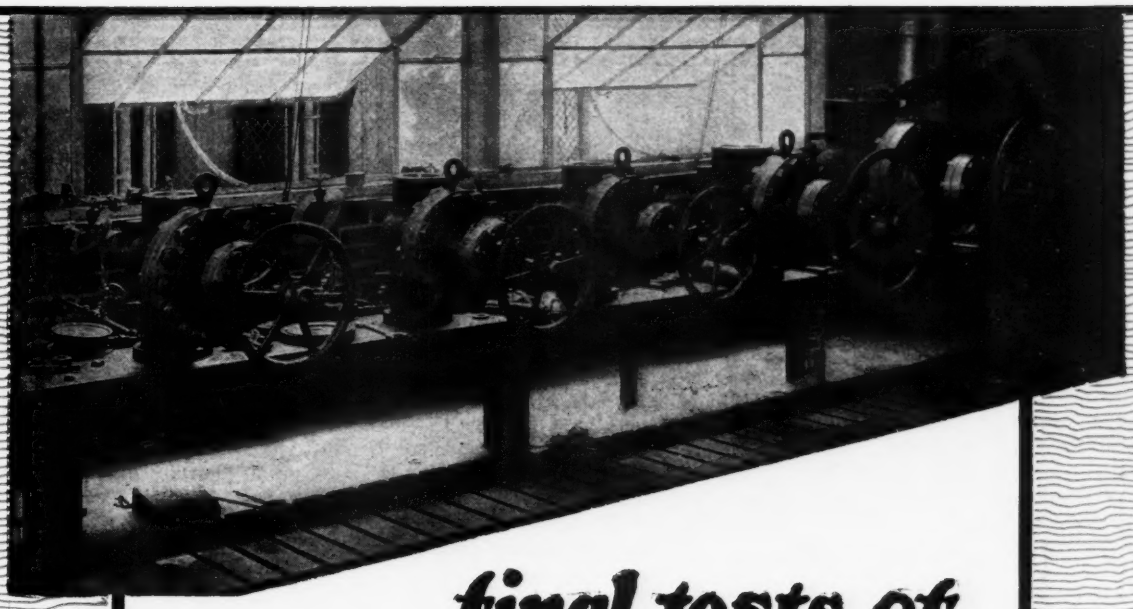
Gas-Absorption Apparatus—Wilbur G. Laird, New York, N. Y., assignor to Henry L. Doherty, New York, N. Y. Filed June 24, 1919. No. 1,666,744.

MISCELLANEOUS

Floating Deck or Cover for Oil Tanks—Charles R. Gallagher, Fullerton, Calif., assignor to Universal Holding Company, Los Angeles, Calif. Filed Sept. 22, 1924. No. 1,666,415.

Floating Deck—Alvah M. Griffin, Los Angeles, Calif., assignor to Universal Holding Company, Los Angeles, Calif. Filed Sept. 27, 1926. No. 1,666,416.

Means for Controlling and Measuring Gas Supply—Thomas H. Clements, Los Angeles, Calif., assignor to F. C. Millard Engineering Company, Los Angeles, Calif. Filed Jan. 11, 1926. No. 1,666,487.



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The Gasoline Tank Car Market Explained

THIS is the fifth installment of the discussion on Tank Car Markets, which has been issued in booklet form by NATIONAL PETROLEUM NEWS *and the* OILGRAM. *Copies have been sent free to all refiners and jobbers. Any who may have been overlooked, we will appreciate their writing us. Or if additional copies of the booklet can be used we will be glad to supply them free of charge.*

—EDITOR.

Watch Definition of Price and Specifications of Products

There also is confusion over what is the open spot market. One must have a definition that stops somewhere in order to have a basis of comparison. The sales with the fewest strings tied to them are made for "prompt shipment" and the industry's long accepted definition of "prompt shipment" is within 10 days. So the prices which the *Oilgram* gathers are on sales for shipment within ten days.

But there are also sales for "shipment over the month"; sales for shipments over a longer period and sales for shipment on a specified date beyond the 10 days, as in the export business. Prices for these various kinds of sales will often differ but there are fundamental reasons why they may differ.

While specifications on gasoline and most petroleum products are nowadays quite definite, well understood and reasonably easy to determine accurately, there still, however, is occasional confusion in the market by the appearance of goods which are off specification in some particular. Every refiner and reputable broker will, of course, inform his prospective customer of this deviation from regular specifications at the outset but in the conversation that goes on in the trade about the "low price," generally the fact that the goods are off specification, is overlooked. And one type of seller has at times broadcasted low prices on such goods without bothering to tell the whole story and has caused much turmoil thereby. Also some jobbers at times, in wiring back to other refiners of this low price, in order to get a counter offer, have forgotten to mention that the low price was because the goods were off.

Then much is also made in conversation about cars which may have to be reconsigned for good cause and on which the refiner is willing to take a lower price to avoid further expense and demurrage. The low price gets much advertising without the reason for it being given.

Only a Limited Number of Cars Create the Low Price

Still another fundamental point on which there is loose thinking, or no thinking at all, is that both buyers and sellers are quite prone to overlook the fact that frequently, at least, there is only a limited quantity of low price goods on the market; only a limited number of cars that the seller or other sellers, are willing to sell at a low price and when those cars have been disposed of, the low price is gone.

No seller makes a low price for all time on all his output. He generally makes a low price to gain a certain definite, immediate end, such as to get in a certain amount of money to pay a certain note, or certain bills payable, or to reduce his stock to a certain extent, or to clean out a certain grade of goods.

We are all familiar with the "sales" of our local merchants. We all appreciate that these cut prices are almost invariably made to get rid of a given number of shirts, or pieces of furniture or something else. We don't get sore when we get to the store so late in the day that we find the line of low price goods has been sold out. We don't expect that merchant to continue to sell us the same quality substantially at the same low price just because we did not get there early enough. We may come back a few days later and find practically the same goods on sale but at a higher price.

But in the oil business this line of thinking is not applied, either by the refiners or the jobbers or the brokers. Once a refiner makes a low price, the trade (that means refiners, brokers and jobbers) seems to feel that the refiner making that low price should apply that price to all his goods indefinitely and that all other refiners should do likewise. That low price, in ordinary conversation, becomes "the market."

It isn't anything of the kind. Because some refiner wants to empty a storage tank or two, or some other refiner wants some cash to meet a note or to pay for some crude, and drops ten cars or even a hundred cars on the market at a price, is no reason why all other refiners should do likewise, nor for all buyers to expect them to. This low price would, of course, be reported in the day's sales and included in the weighted average for what it is worth.

Refiners could undoubtedly do much toward clearing up this kind of loose thinking if they would specify the exact number of cars they offer at a low price, or in fact at any price. If the refiner is willing to sell more cars at that price, that can be developed by negotiation, but at all events making the quotation on a certain number of cars will tend to make the other refiners and brokers and jobbers too, realize that there is, or may be, a definite limit on the number of cars that will be sold at that price.

In these days it is much easier to break down a price, or a market, than it is to raise it. Just a whisper of an alleged price cut will have far more effect against a price than the soundest of reasoning will boost a price.

You frequently hear buyers say that such-and-such a price as to the market is not correct because they just got an offer or just made a purchase five minutes ago at a less price. These people overlook the fact that a price as currently reported is not made until a sale has been completed to establish it. Prior to a sale being made at a price, the price is simply a quotation. Market publishing authorities can only report the prices established as the result of actual sales, and then publish separately offers to buy or sell but qualifying the latter as such.

In a changing market, such as in the gasoline tank car market, yesterday's sales may have averaged at say 6 cents. That is no sign that today's sales will be the same. Of course the chances are today's price, barring something most unusual, will be at about that figure but no one knows until after today's sales have been made and the price on those sales established. That today's offers are at 5½ cents is no reflection upon the publishing authority which said that yesterday's sales were at 6 cents. No more than the fact that the sun shines today is any reflection upon the newspaper for saying that it rained yesterday when it did rain yesterday.

A market so-called is not some indefinable thing which guarantees to all sellers the highest price quoted, nor to all buyers the lowest price made; nor does it hold prices indefinitely to all comers.

A market is made up of individual sales and each individual sale is an absolutely separate transaction.

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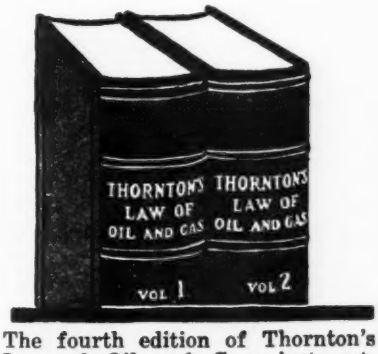

The fourth edition of Thornton's Law of Oil and Gas, just out, gives the latest compilation of all statutes and court decisions pertaining to oil and natural gas.

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INDEX TO ARTICLES

Selected Bibliography on Petroleum Technology

Editor's Note—The brief abstracts of current literature printed below are so arranged that they may be cut apart and mounted on 3" x 5" library indexing cards. The indexing numbers assigned bring the cards into logical sequence in the files. The "Decimal Index of Petroleum Technology" gives the key to the articles. This book is published exclusively by NATIONAL PETROLEUM NEWS as a service to its readers. Price $1.00. Abstracts started April 4, 1928.

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Wagner, Paul **094.6**

"Gaging Wells on Lease Tanks Avoid Sulfur Gas Poisoning."

National Petroleum News, March 28, 1928, p. 79-80.

The hydrogen sulfide problem in west Texas from the standpoint of the worker is discussed in this article. Mr. Wagner describes the gaging wells, and installation methods. Extracts are given from a report on the use of gaging wells by H. C. Fowler, petroleum engineer of the United States Bureau of Mines, Department of Commerce, which was issued shortly before this article was written. Mr. Fowler's report is a study on hydrogen sulfide as related to the welfare of the worker and gives hints on the cleaning of tanks. Further articles in Mr. Wagner's series deal with hydrogen sulfide as related to the problem of equipment corrosion and elimination of sulfur compounds.

Foster, J. L. (Chief engineer, Lone Star Gas Co.) **615.3**

"Pipe Line Bridges Solve River Crossing Problems."

Natural Gas, Vol. 9, No. 3. March, 1928, pp. 3-5.

The type of bridge to be used for crossing sand bed rivers was determined by the kind of formation underlying the quick sand. Four types were considered, namely, the pile trestle, the suspension, the swing and the pony truss bridges. The pile trestle bridge is the least expensive to construct. The article discusses varying conditions and how they were dealt with in accomplishing the desired result.

Halbert, Ward K. **961.3**

"Jobber Sells 1000 Miles of Scenery, Incidentally Gas and Oil"

National Petroleum News, April 11, 1928, pp. 26-27.

How the Davenport Oil & Supply Co., Davenport, Iowa, increased gallonage by advertising scenic Sunday trips is told by Mr. Halbert. The original effort resulted in a 10 per cent return, and with sufficient additional business to pay for printing and mailing expenses. The article tells what the company plans for 1928, about two-day trips, about advertising hotels and restaurants enroute, and what copy the direct mail pieces contain.

Meek, Charles E. **365.**

"Genesis of a Sandstone Dyke As Indicated By Heavy Minerals."

Bulletin of American Association of Petroleum Geologists, Vol. 12, No. 3. March, 1928, pp. 271-277.

Oil and tar occurrences in a small tar-impregnated dyke and the overlying Pleistocene beds in an area just east of the old Newport Beach field, Orange county, California, are discussed. The oil and tar are described as probably entering subsequently to the sand-filling of the dyke. The writer discusses heavy mineral analyses in relation to conditions that are essentially geological. (Cross Index Under 341.)

R. Beatte **721.3**

"Methods of Minimizing Accident Hazards of Cracking Plant Operations"

National Petroleum News, March 28, 1928, pp. 87-88, as presented before group meeting Mid-Continent safety directors, Tulsa, Feb. 24, 1928.

Natural desire to get every possible gallon through each cracking unit in the plant should be tempered with consideration for the operators' safety. Danger comes not from design of the equipment and not from necessary operating methods. Carelessness is the cause of the greatest number of accidents to cracking equipment.

Emig, Frank H. **940.5**

"Cost Finding Methods for Marketers and How to Use Them"

Article 5

National Petroleum News, April 11, 1928, p. 102-108

The balance sheet and the profit and loss statement are explained. Both statements are defined with detailed information as to their workings. Explanations are given for various types of business organization, from the sole owner to the corporation. How to get started on an accurate set of books is explained also by Mr. Emig; either by checking and rechecking past errors to discover discrepancies, or to start as though there were no previous records.

Determination of Manufacturing Expense By Refinery Departments

By J. E. Johnson*

Presented before National Petroleum Association, Cambridge Springs, April 20

THIS article is a detailed description, including copies of 24 forms, of a segregation and classification of refinery operating expense by various departments. This classification presents a method for accounting control.

Refinery and general expenses are divided into productive and non-productive departments, including delivery and sales expense, and general and administrative expenses, as well as direct plant operating expense.

The method of determining cost of sales is shown and the preparation of the company profit and loss statement.

UP TO the present there has not yet been developed a satisfactory and simplified method of cost accounting for the Pennsylvania refinery.

This is due largely to the fact that many products are derived from the basic raw material, which, in the course of processing, enters into several semi-finished stages and is run and re-run, filtered and re-filtered; each time changing its identity to a certain extent.

To find absolute, accurate costs, would entail considerable transferring to and from inventories and, in a great many instances, the semi-finished products would necessarily have to be valued at arbitrary costs.

Our company decided to abandon any attempt to determine costs, but rather to confine our efforts to the control of manufacturing expenses through the segregation of departmental expenses.

The determination of manufacturing expenses by departments has two advantages.

First: Close supervision of the expenses of each department. The possibility of analysis of the results therefrom, and the opportunity of intelligently attacking the problem of elimination of waste and reduction of expenses.

Second: An accurate record of expenses by departments permits the determination of expenses of a process per unit and enables an intelligent analysis as to whether a certain product can be sold at a price to yield a profit.

Classification of Expense

To control expenses, it is necessary to divide the refinery and general expenses into productive and non-productive departments, and to segregate the expenses of each department.

Productive departments are as follows: fire stills, steam stills, treating, wax plant, filter house, plant general expenses, cracking plant, bright stock and sharples plant, grease plant.

In addition, steam plant expense and plant overhead are separately classified for allocation to the various productive departments listed above.

Non-productive departments are as follows: warehouse, delivery by tank cars, delivery by barges, delivery by tank trucks, delivery by stake trucks, selling expenses, general and administrative.

There are three classes of expenses in each of the above departments, both productive and non-productive; operating expenses, maintenance and repairs, fixed charges.

Operating expenses are the direct expenses incidental to the operation of the department, such as labor, steam, supplies and expenses.

Maintenance and repairs are expenses, such as labor and material, necessary to maintain the plant and equipment, and keep it in an efficient operating condition. The total charges to this division of the plant for a period of time may determine the advisability of investing additional capital to obtain more economical operating conditions. Therefore, it is of much importance to determine the advisability of investing additional capital to obtain more economical operating conditions. Therefore, it is of much importance to determine the expense of maintaining operating efficiency.

Fixed charges are insurance, taxes and depreciation on the amount of capital invested in each division of the business.

Since there could be but limited manufacture without capital investment in buildings, machinery and equipment, fixed charges are a part of manufacturing expenses, as much so as labor and materials.

Fire insurance is an expense necessary to protect the investment in buildings, machinery and equipment and is, therefore, a portion of the productive expense.

Taxes on the amount of capital invested in fixed assets are also charges against expenses incidental to manufacture.

Depreciation on the capital invested in fixed assets of a producing unit is properly chargeable to the expense of the department. If there were no capital investments required in production (a most unusual situation), there would of course be no necessity for insurance and taxes. Since insurance and taxes are expenses incidental to manufacture, surely depreciation on the investment likewise should be charged to the department requiring a capital outlay for buildings, equipment, etc.

If manufacture is conducted in leased buildings and by leased machinery and equipment, there may not be any charges for insurance, taxes and depreciation, in which event there would be a charge for rental, in which I am sure the landlord would include insurance, taxes and depreciation.

I will not attempt to detail the expenses applicable to each department, but will take each division of expenses and briefly summarize the major items of expense entering therein.

Plant Overhead Expenses: (Form No. 1)—Plant overhead expenses include salaries of superintendents, refinery office, clerks and stenographers, refinery office supplies, salaries of chemists and laboratory supplies, labor of machinists, maintenance and repairs, and fixed charges.

The total of plant overhead expenses are prorated to various departments as shown on the form.

The amount to be charged to other departments is based on the ratio of the investment of each department to the total plant investment in buildings, machinery and equipment.

Steam Plant Expenses: (Form No. 2)—This department is charged with labor, fuel supplies and miscellaneous expenses used to generate steam, also

*Waverly Oil Works Co., Pittsburgh.

maintenance and repairs, and fixed charges.

The total expenses of the steam plant are prorated to other departments as shown on the form on the basis of service rendered to the other departments. This may be an arbitrary percentage basis of the entire cost, or an actual measurement of the steam transported. Where flow meters are not available, an estimate may be prepared, which can be fairly accurate.

This department does not receive a prorata share of the plant overhead expenses since the steam plant expenses themselves are prorated and it would necessitate an additional distribution to arrive at the same results.

The expense per barrel of crude run and the expense per pound of steam generated are shown on the report of steam plant expenses.

Fire Still Expenses: (Form No. 3)—Charges include labor, coal, steam, a percentage of plant overhead, maintenance and repairs, and fixed charges.

The expense per barrel of raw crude run and the expense per barrel of rerun are shown on this report.

Steam Still Expenses: (Form No. 4)—Charges include labor, steam, fuel, miscellaneous expenses, a percentage of plant overhead expenses, maintenance and repairs, and fixed charges.

The expense per barrel of oil put through these stills is found as shown on this report.

Treating Expenses: (Form No. 5)—Charges include labor, steam, treating materials, maintenance and repairs, and fixed charges.

The expense per barrel of material treated is found as shown on this report.

Wax Plant Expenses: (Form No. 6)—Charges include labor, steam packing expenses, supplies, maintenance and repairs, and fixed charges.

The expense per barrel of wax distillate used is found as shown on this report.

Filter House Expenses: (Form No. 7)—Charges include labor, fuel for clay burning, steam, earth used, a percentage of plant overhead expenses, maintenance and repairs, and fixed charges.

The expense per barrel of raw oil filtered, expense per barrel of throughput through the filters, and the expense per ton of earth burned are found as shown on this report.

Plant General Expenses: (Form No. 8)—This department covers the expense of operating lines, pumps and storage tanks, miscellaneous yard labor, and sundry items.

The expenses of this department are

FORM No. 1, PLANT OVERHEAD EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Barrel of Crude Run
501	Supervision	$.....	
502	Stenographers	.....	
503	Clerks	.....	
504	Watchmen	.....	
505	Machinists	.....	
506	Office Supplies	.....	
507	Stationery & Printing	.....	
508	Light, Heat & Power	.....	
509	Laboratory Labor	.....	
510	Laboratory Supplies	.....	
511	Miscellaneous	.....	
	TOTAL	.....	.....
	Maintenance & Repairs		
521	Labor	.....	
522	Material	.....	
523	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges		
531	Insurance	.....	
532	Taxes	.....	
533	Depreciation	.....	
	TOTAL	$.....	.....
	Total Plant Overhead Expenses	.....	.....

Investment Account includes Refinery Office, Laboratory Building, Laboratory Equipment, Refinery Office Furniture and Equipment, etc.

PRO-RATED AS FOLLOWS

	Investment	Percentages	Proration of Plant Overhead Expenses
Fire Still Expenses	.....	.....	.....
Steam Still "	.....	.....	.....
Treating "	.....	.....	.....
Wax Plant "	.....	.....	.....
Filter House "	.....	.....	.....
Plant General "	.....	.....	.....
Cracking Plant "	.....	.....	.....
Bright Stock & Sharples Ex.	.....	.....	.....
Grease Plant Expenses	.....	.....	.....
TOTAL	.....	.....	.....

FORM No. 2, STEAM PLANT EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Crude Run	Per lb. of Steam
601	Labor	$.....		
602	Coal	.....		
603	Fuel Oil	.....		
604	Gas	.....		
605	Water Softening Supplies	.....		
606	Miscellaneous	.....		
607	.....% Plant Overhead	.....		
	TOTAL	.....	.....	.....
	Maintenance & Repairs:			
621	Labor	.....		
622	Material	.....		
623	Extraordinary Repairs	.....		
	TOTAL	.....	.....	.....
	Fixed Charges:			
631	Insurance	.....		
632	Taxes	.....		
633	Depreciation	.....		
	TOTAL	.....	.....	.....
	Total Steam Plant Expenses	$.....	.....	.....
	Barrels of Crude Run	.....		
	Pounds of Steam Generated	.....		

Investment Account includes Boiler House Building and contents, coal sidings, coal handling machinery, ash conveyors, all steam lines and other investments incidental to generating and transporting steam to other departments.

PRO-RATED AS FOLLOWS:

	Pounds of Steam Furnished or other Method of Proration Adopted	Percentage	Amounts
Fire Still Expense	.....	.....	.....
Steam Still Expense	.....	.....	.....
Treating "	.....	.....	.....
Wax Plant "	.....	.....	.....
Filter House "	.....	.....	.....
Plant General Expense	.....	.....	.....
Cracking Plant Expense	.....	.....	.....
Bright Stock & Sharples Exp.	.....	.....	.....
Grease Plant Expense	.....	.....	.....
Warehouse Expense	.....	.....	.....
Tank Car Delivery Expense	.....	.....	.....
Barge Delivery Expense	.....	.....	.....
Gen. & Administrative Exp.	.....	.....	.....
TOTAL	.....	.....	.....

FORM No. 3, FIRE STILL EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Amounts	Per Bbl. of Crude Run	Per Bbl. of Rerun	Per Bbl. of Total Run
701 Labor	$.....			
702 Coal	.....			
703 Steam	.....			
704 Miscellaneous	.....			
705 ....% Plant Overhead	.....			
TOTAL	.....	.....	.....	.....
Maintenance & Repairs:				
721 Labor	.....			
722 Material	.....			
723 Extraordinary Repairs	.....	.....	.....	.....
TOTAL	.....	.....	.....	.....
Fixed Charges:				
731 Insurance	.....			
732 Taxes	.....			
733 Depreciation	.....			
TOTAL	.....	.....	.....	.....
Total Fire Still Expenses	.....	.....	.....	.....
Barrels of Crude Run		.....Barrels		
Barrels of Crude Rerun		.....Barrels		
Total Barrels Run		.....Barrels		

Investment account to include stills, vapor lines, condensers, oil lines to and from stills, Tool House and pumps.

FORM No. 4, STEAM STILL EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. Charged
801	Labor	$.....	
802	Steam	.....	
803	Fuel	.....	
804	Miscellaneous	.....	
805	....% Plant Overhead	.....	
	TOTAL		
	Maintenance & Repairs:		
821	Labor	.....	.....
822	Material	.....	
823	Extraordinary Repairs	.....	
	TOTAL	.....	
	Fixed Charges:	.....	.....
831	Insurance	.....	
832	Taxes	.....	
833	Depreciation	.....	
	TOTAL	.....	.....
	Total Steam Still Expenses	.....	

Investment includes stills, settings, lines to and from condensers and pumps.

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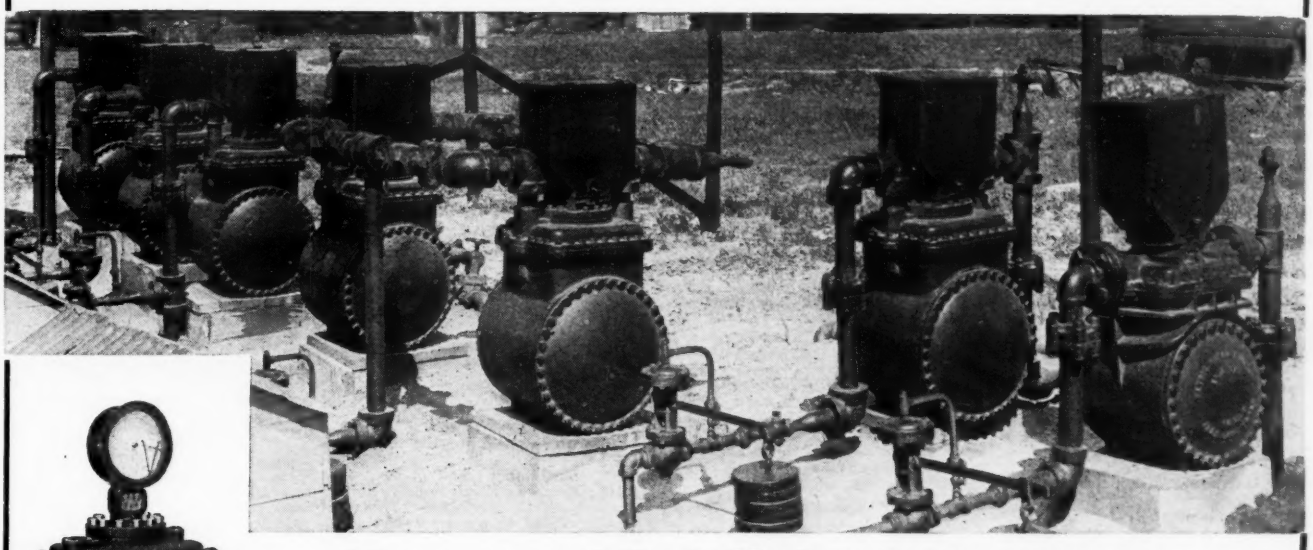

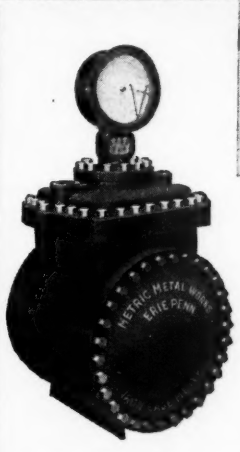

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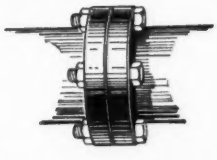

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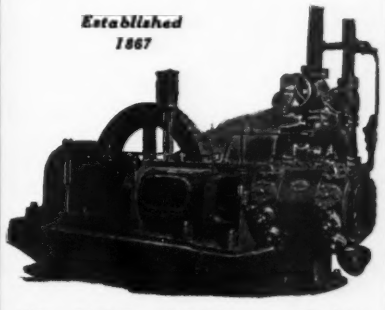

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not chargeable to many of the others and, for that reason, it is deemed best to carry it as a separate expense account and not attempt to prorate it to other departments.

We have segregated this expense into a separate division, as it is largely non-productive and an expense account which will bear close supervision. By so segregating these expenses in our refinery, we have been able to effect substantial savings from time to time.

Charges to this account cover labor pumping, yard labor, miscellaneous labor, steam for pumps, a percentage of plant overhead expenses, maintenance and repairs, and fixed charges on the investment in storage tanks and lines, water wells, pumps and sundry floating equipment.

The expense per barrel of crude consumed is determined as shown on this report.

Cracking Plant (Form No. 9)—Charges include labor, steam, fuel, maintenance and repairs, and fixed charges.

The expense per barrel of gasoline produced and the expense per barrel of raw stock run are found as shown on this report.

If the total expenses are used to

FORM No. 5, TREATING EXPENSES

Blank Refining Company.
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. Treated
901	Labor	$.....	
902	Steam	.....	
903	Acids	.....	
904	Caustics	.....	
905	Litharge	.....	
906	Clay	.....	
907	Miscellaneous	.....	
908	....% Plant Overhead	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
921	Labor	.....	
922	Material	.....	
923	Extraordinary Repairs	.....	
	TOTAL		
	Fixed Charges:	.....	.....
931	Insurance	.....	
932	Taxes	.....	
933	Depreciation	.....	
	TOTAL	.....	.....
	TOTAL TREATING EXPENSES	$.....	.....
	TOTAL BARRELS TREATED	.....	

Investment includes agitators and their settings, lines to and from, blowers, pumps and any other equipment necessary for treating.

FORM No. 6, WAX PLANT EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Distillate
1001	Labor	$.....	
1002	Steam	.....	
1003	Packing Expenses	.....	
1004	Ammonia	.....	
1005	Clay	.....	
1006	Miscellaneous	.....	
1007	....% Plant Overhead	.....	
	TOTAL		
	Maintenance & Repairs:	.....	.....
1021	Labor	.....	
1022	Material	.....	
1023	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:	.....	
1031	Insurance	.....	
1032	Taxes	.....	
1033	Depreciation	.....	
	TOTAL	.....	.....
	Total Wax Plant Expenses	$.....	.....

Investment account includes buildings, presses, sweaters, refrigerating equipment, atmospheric condensers, wax filters, and any other equipment necessary for operation of a Wax Plant.

FORM No. 7, FILTER HOUSE EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Raw Oil	Per Bbl. of Throughput
1101	Labor Filtering	$.....		
1102	Labor Burning	.....		
1103	Fuel (Clay Burning)	.....		
1104	Steam	.....		
1105	Fuller's Earth	.....		
1106	Miscellaneous	.....		
1107	....% Plant Overhead	.....		
	TOTAL	.....	.....	.....
	Maintenance & Repairs:	.....		
1121	Labor	.....		
1122	Material	.....		
1123	Extraordinary Repairs	.....		
	TOTAL	.....	.....	.....
	Fixed Charges:	.....		
1131	Insurance	.....		
1132	Taxes	.....	.....	.....
1133	Depreciation	.....		
	TOTAL	.....		
	Total Filter House Expenses	$.....	.....	.....
	Tons of Earth Burned	.....		
	Expense per ton	.....		
	Barrels Raw Oil Filtered	.....		
	Total Barrels Through Filters	.....		

Investment Account includes buildings, run-down tanks, clay burners, and building, pumping equipment, and other equipment necessary for filtering.

FORM No. 8, PLANT GENERAL EXPENSES

Blank Refining Company.
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Crude Run
1201	Labor Pumping	$.....	
1202	Labor Loading	.....	
1203	Labor Miscellaneous	.....	
1204	Steam	.....	
1205	....% Plant Overhead	.....	
1206	Miscellaneous	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
1221	Labor	.....	
1222	Material	.....	
1223	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:	.....	
1231	Insurance	.....	
1232	Taxes	.....	
1233	Depreciation	.....	.....
	TOTAL		
	Total Plant General Expense	$.....	.....

Investment Account includes pump house, and pumps, general tankage and storage, run-down tanks, yard lines, loading and unloading lines, water wells and pumps, machine shop, pipe shop and all floating equipment.

FORM No. 9, CRACKING PLANT EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Raw Stock	Per Bbl. of Gasoline Prod.
1301	Labor	$.....		
1302	Steam	.....		
1303	Fuel	.....		
1304	Royalties	.....		
1305	Miscellaneous	.....		
1306	....% Plant Overhead	.....		
	TOTAL	.....	.....	.....
	Maintenance & Repairs:			
1321	Labor	.....		
1322	Material	.....		
1323	Extraordinary Repairs	.....		
	TOTAL	.....	.....	.....
	Fixed Charges:			
1331	Insurance	.....		
1332	Taxes	.....		
1333	Depreciation	.....		
	TOTAL	.....	.....	.....
	Total Cracking Plant Expenses	$.....	.....	.....
	Total Bbls. of Raw Stock Used	.....		
	Total Bbls. of Gasoline Produced	.....		

Investment Account includes entire cracking unit, towers, condensers, etc.

FORM No. 10, BRIGHT STOCK & SHARPLES EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Bbl. of Raw Stock Used	Per Bbl. of Production
1401	Labor	$.....		
1402	Refrigerating (Labor & Material	.....		
1403	Cutting Naphtha	.....		
1404	Steam	.....		
1405	Supplies	.....		
1406	....% Plant Overhead	.....		
	TOTAL	.....	.....	.....
	Maintenance & Repairs:			
1421	Labor	.....		
1422	Material	.....		
1423	Extraordinary Repairs	.....		
	TOTAL	.....	.....	.....
	Fixed Charges:			
1431	Insurance	.....		
1432	Taxes	.....		
1433	Depreciation	.....		
	TOTAL	.....	.....	.....
	Total Bright Stock & Sharples Expenses	$.....	.....	.....
	Total Barrels of Stock Used	.....		
	Total Barrels Bright Stock Produced	.....		
	Total Barrels Petrolatum Produced	.....		
	Total Barrels Production	.....		

Investment Account includes refrigerating equipment, cold settling tanks, filters, stills, etc.

FORM No. 11, SUMMARY OF REFINERY EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Department	Operating	Maintenance & Repairs	Fixed Charges	Total Expenses
Fire Stills				
Steam Stills				
Treating				
Wax Plant				
Filtering				
Plant General				
Cracking Plant				
Bright Stock & Sharples				
TOTAL		.....	.....	.....
Per Bbl. of Crude Run		.....	.....	.....

FORM No. 12, GREASE PLANT EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Pound of Production
1501	Supervision	$.....	
1502	Labor	.....	
1503	Steam	.....	
1504	Supplies	.....	
1505	Miscellaneous	.....	
1506	....% Plant Overhead	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
1521	Labor	.....	
1522	Material	.....	
1523	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:		
1531	Insurance	.....	
1532	Taxes	.....	
1533	Depreciation	.....	
	TOTAL	$.....	.....
	Total Grease Plant Expenses	$.....	.....
	Total Number of Pounds Produced	.....	

Investment Account includes Buildings, tanks and equipment.

FORM No. 13, WAREHOUSE EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Gallon Filled
1601	Labor: Warehouse	$.....	
1602	Labor: Cooperage	.....	
1603	Steam	.....	
1604	Paint	.....	
1605	Miscellaneous	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:	.....	
1621	Labor	.....	
1622	Material	.....	
1623	Extraordinary Repairs	.....	.....
	TOTAL		
	Fixed Charges:	.....	
1634	Rentals	.....	.....
1631	Insurance	.....	
1632	Taxes	.....	
1633	Depreciation	.....	
	TOTAL	.....	
	Total Warehouse Expenses	$.....	.....
	Total Gallons Filled	.....	
	Shipments:		
	Gallons Bulk	.....	
	I.C.C. Drums	.....	
	O.T.S. Drums	.....	
	Half Barrels	.....	
	Fourth Barrels	.....	
	10 Gal. Cans	.....	
	5 Gal. Cans	.....	
	1 Gal. Cans	.....	
	etc.	.....	

Investment Account includes warehouse buildings, tanks and other equipment.

FORM No. 14, TANK CAR DELIVERY EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Gallon Shipped
1701	Supervision	$.....	
1702	Labor	.....	
1703	Clerks & Stenographers	.....	
1704	Steam	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
1721	Labor	.....	
1722	Material	.....	
1723	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:		
1731	Insurance	.....	
1732	Taxes	.....	
1733	Depreciation	.....	
1734	Rentals	.....	
	TOTAL	.....	.....
	Total Tank Car Delivery Expenses	$.....	.....
	Less:		
1751	Tank Car Mileage Earned	.....	.....
	Net Tank Car Delivery Expenses	$.....	.....
	Number of Gallons Shipped	.....	.....
	Number of Trips per car owned	.....	.....

Investment includes tank cars.

FORM No. 15, BARGE DELIVERY EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amount	Per Gal. Delivered
1801	Labor (Loading & Unloading)	$.....	
1802	Steam	.....	
1803	Towing	.....	
1804	Miscellaneous	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
1821	Labor	.....	
1822	Materials	.....	
1823	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:		
1831	Insurance	.....	
1832	Taxes	.....	
1833	Depreciation	.....	
1834	Rentals	.....	
	TOTAL	.....	.....
	Total Barge Delivery Expenses	$.....	.....
	Total Gallons from Plant	.....	.....
	Total Gallons to Plant	.....	.....
	Total Gallons Delivered	.....	.....

Investment includes Barges and Loading Docks.

FORM No. 16, TANK WAGON DELIVERY EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Gallon Delivered
1901	Supervision	$.....	
1902	Labor: Drivers	.....	
1903	Gasoline	.....	
1904	Oil & Grease	.....	
1905	Tires	.....	
1906	Storage	.....	
1907	Washington	.....	
1908	Other Supplies	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
1921	Repairs	.....	
1922	Painting	.....	
1923	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:		
1931	Insurance	.....	
1932	Taxes	.....	
1933	Depreciation	.....	
1934	Rentals	.....	
1935	Licenses	.....	
	TOTAL	.....	.....
	Total Tank Wagon Delivery Expenses	$.....	.....
	Gallons Gasoline Delivered	.....	
	Gallons Fuel Oil Delivered	.....	
	Gallons Kerosene Delivered	.....	
	Gallons Lub. Oil (Bulk) Delivered	.....	
	TOTAL GALS. DELIVERED	.....	

FORM No. 17, STAKE TRUCK DELIVERY EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Package Delivered
2001	Supervision	$.....	
2002	Labor-Drivers	.....	
2003	Gasoline	.....	
2004	Oil & Grease	.....	
2005	Tires	.....	
2006	Storage	.....	
2007	Washing	.....	
2008	Other Supplies	.....	
	TOTAL	.....	.....
	Maintenance & Repairs:		
2021	Repairs	.....	
2022	Painting	.....	
2023	Extraordinary Repairs	.....	
	TOTAL	.....	.....
	Fixed Charges:		
2031	Insurance	.....	
2032	Taxes	.....	
2033	Depreciation	.....	
2034	Rentals	.....	
2035	Licenses	.....	
	TOTAL	.....	.....
	Total Stake Truck Delivery Expenses	$.....	.....
	Delivered:		
	Barrels I. C. C.	.....	
	O. T. S.	.....	
	Cases	.....	
	TOTAL PACKAGES	.....	

Investment includes Stake Trucks.

determine production costs, the expense for treating and re-running should be considered.

Bright Stock & Sharples Expenses: (Form No. 10)—Charges include labor, refrigerating expenses, naphtha used for cutting, steam, maintenance and repairs, and fixed charges.

The expense per barrel of stock used and the expense per barrel of stock produced are found, as shown on this report.

For statistical purposes the total barrels of petrolatum produced are also shown.

If the expenses are used to determine costs, the expenses for filtering and re-running should be considered.

Summary of Refinery Expenses: (Form No. 11)—The expense of the refinery productive units are summarized and the expense per barrel of crude run is determined on the total operating, maintenance and repairs, and fixed charges.

The total refinery expenses are used to determine the cost of sales on Form No. 20, as later described.

Grease Plant Expenses: (Form No. 12)—The grease plant is handled as a branch, separate from the refinery, and not included in the refinery production.

Materials used in the grease plant are charged to raw material inventory of grease plant, and when transferred from the refinery, the refinery finished inventory receives credit.

However, the grease plant is charged with a percentage of the plant overhead and a service charge for the steam used.

Charges to the grease plant expenses are salaries of superintendent, labor, steam, percentage of plant overhead expense, maintenance and repairs, and fixed charges.

The expense per pound is determined as shown on this form.

Non-Productive Departments

I will next take up the major items of expenses entering into the non-productive departments.

Warehouse Expenses: (Form No. 13)—Warehouse expenses include charges for warehouse and cooperage shop labor, steam, paint, miscellaneous supplies, maintenance and repairs, and fixed charges.

FORM No. 18, SELLING EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Cent To Sales
2101	Supervision	$.....	.....
2102	Clerks	.....	.....
2103	Stenographers	.....	.....
2104	Salesmen's Salaries	.....	.....
2105	Salesmen's Commissions	.....	.....
2106	Salesmen's Expenses	.....	.....
2107	Office Supplies	.....	.....
2108	Stationery & Printing	.....	.....
2109	Postage	.....	.....
2110	Telephone & Telegraph	.....	.....
2111	Legal Expenses	.....	.....
2112	Service Department	.....	.....
2113	Advertising	.....	.....
2114	Entertainment	.....	.....
2115	Miscellaneous	.....	.....
	TOTAL	$.....	.....
	Maintenance & Repairs:		
2121	Office Building & Equipment	.....	.....
2122	Service Station Equipment	.....	.....
2123	Automobiles	.....	.....
	TOTAL	$.....	.....
	Fixed Charges:		
2131	Insurance	.....	.....
2132	Taxes	.....	.....
2133	Depreciation	.....	.....
	TOTAL	$.....	.....
	TOTAL SELLING EXPENSES	.....	.....

Investment Account to include office buildings, office furniture and fixtures, office equipment, salesmen's automobiles, service station equipment, leased to dealers, and any other capital investment incidental to the sales organization.

FORM No. 19, GENERAL & ADMINISTRATIVE EXPENSES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Investment:
Beginning of Year $.....
Additions $.....
Total to Date $.....

Account Number	Operating	Amounts	Per Cent To Sales
2201	Salaries: Officers & Executives	$.....	.....
2202	Salaries: Clerks	.....	.....
2203	Salaries: Stenographers	.....	.....
2204	Traveling Expenses	.....	.....
2205	Office Supplies	.....	.....
2206	Stationery & Printing	.....	.....
2207	Postage	.....	.....
2208	Telephone & Telegraph	.....	.....
2209	Legal Expenses	.....	.....
2210	Donations	.....	.....
2211	Entertainment	.....	.....
2212	Welfare Work	.....	.....
2213	Collection Expenses	.....	.....
2214	Subscriptions & Periodicals	.....	.....
2215	Assessment & Dues	.....	.....
2216	Convention Expenses	.....	.....
2217	Miscellaneous	.....	.....
	TOTAL	$.....	.....
	Maintenance & Repairs:		
2221	Office Building	.....	.....
2223	Equipment	.....	.....
2224	Automobiles	.....	.....
	TOTAL	$.....	.....
	Fixed Charges:		
2231	Insurance		
2232	Taxes	.....	.....
2233	Depreciation	.....	.....
2234	Rentals	.....	.....
	TOTAL	$.....	.....
	TOTAL GENERAL & ADMINISTRATIVE EXPENSES	.....	.....

Investment Account to include Office Buildings, office furniture and fixtures, office equipment, automobiles of executives and any other capital investment incidental to the general office.

FORM No. 20, SUMMARY OF COST OF SALES

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

Refinery:			
Inventory at beginning (Finished)		$.....	
Refinery Expenses		$.....	
Crude Oil Consumed		$.....	
Other Raw Materials Consumed		$.....	
Grease Plant Products Used		$.....	
Less:			
Finished Products to Grease Plant	$.....		
Finished Inventory at End	$.....		
Cost of Sales—Refinery			$.....
Grease Plant:			
Inventory at beginning (Finished)		$.....	
Grease Plant Expenses		$.....	
Raw Materials Used		$.....	
Refinery Products Used		$.....	
Less:			
Finished Inventory at End	$.....		
Finished Products to Refinery	$.....		
Cost of Sales—Grease Plant			$.....
TOTAL COST OF SALES			$.....

FORM No. 21, SUMMARY OF PROFIT & LOSS ACCOUNT

Blank Refining Company,
Pittsburgh, Pa.
Month Ended.....192.....

	Amounts	Per Cent To Sales
Sales:		
Refinery	$.....	
Grease Plant	.....	
TOTAL SALES	$.....	.....
Cost of Sales:		
Refinery	.....	
Grease Plant	.....	
TOTAL COST OF SALES	.....	.....
Gross Profit:		
Refinery	.....	
Grease Plant	.....	
TOTAL GROSS PROFIT	.....	.....
Warehouse & Delivery Expenses		
Warehouse	.....	
Tank Car	.....	
Barge	.....	
Tank Trucks	.....	
Stake Trucks	.....	
TOTAL WAREHOUSE & DELIVERY EXPENSE	.....	.....
PROFIT BEFORE GENERAL EXPENSES	.....	.....
General Expenses:		
Selling	.....	
General & Administrative	.....	
TOTAL GENERAL EXPENSES	.....	.....
PROFIT BEFORE OTHER INCOME	.....	.....
Other Income:		
Interest & Discount Earned	.....	
Branches	.....	
Miscellaneous	.....	
TOTAL OTHER INCOME	.....	.....
PROFIT BEFORE OTHER EXPENSES	.....	.....
Other Expenses:		
Interest	.....	
Reserved for Bad Debts	.....	
Miscellaneous	.....	
TOTAL OTHER EXPENSES	.....	.....
PROFIT BEFORE FEDERAL TAXES	.....	.....
RESERVED FOR FEDERAL TAXES	.....	.....
NET PROFIT OR LOSS	.....	.....

The expense per gallon filled is determined as shown on this form.

Delivery Expenses (Forms Nos. 14-15-16 and 17)—Delivery expenses cover delivery by tank cars, river barges, tank trucks and stake trucks.

Tank car delivery expenses include salaries of traffic department, maintenance and repairs, and fixed charges.

The expense per gallon of products shipped are determined as provided for on Form No. 14.

Barge delivery expenses include labor loading and unloading, steam, towing charges, maintenance and repairs, and fixed charges.

Expense per gallon delivered is determined as provided for on Form 15.

Tank wagon deliveries include salary of tank wagon superintendent, labor of drivers, gasoline, oil and greases used, tires, storage, washing, maintenance and repairs, and fixed charges.

The expense per gallon delivered is determined as provided for on Form No. 16.

Stake truck delivery expenses include practically the same items of expense as tank wagons.

The expense per package delivered is determined as provided for on Form No. 17.

Selling Expenses: (Form No. 18)—This form includes salaries of managers, salesmen and clerks, travelling expenses, commissions paid, office supplies, postage, telephone and telegraph, advertising, maintenance and repairs on office furniture and fixtures, and on service station equipment installed. Fixed charges include insurance, taxes and depreciation on office buildings and equipment, service station equipment and automobiles.

The per cent of each expense to the total sales is determined as shown on this report.

General & Administrative Expenses: (Form No. 19)—This form includes salaries of officers, executives, clerks and stenographers, travelling expenses, stationery and printing, office supplies, postage, telephone and telegraph, legal expenses, donations, etc.

Maintenance and repairs include expenses of maintaining office buildings, furniture and fixtures, office equipment, automobiles, etc.

Fixed charges include insurance, taxes and depreciation on the investment and rentals in event office space is rented from an outside party.

I believe I have covered the major items of expense incidental to the business.

I will next take up the preparation of the profit and loss statement.

Summary of Cost of Sales: (Form No. 20)—To find the cost of sales of the refinery, we add to the finished inventory on hand at beginning of the month; Total refinery expenses (as shown on Form No. 11), crude consumed, other raw materials consumed, grease plant products consumed.

From this we deduct; finished products delivered to the great plant, and finished inventory at the end of the month.

The same method is used in calculating the cost of sales for the valuations of finished inventories. There are a number of methods used.

Summary of Profit and Loss Account: (Form No. 21)—This statement includes; sales, cost of sales, gross profit, warehouse & delivery expenses, general expenses, other income, other expenses, reserve for federal taxes, net profit or loss.

Each expense item thereon is calculated as per cent to net sales. A comparison of these reports from month to month is valuable to the management.

General Ledger Control Accounts—Control accounts only are carried in the general ledger for sales and expense accounts. Detailed accounts in code number are carried in an expense ledger which balances with the general ledger control monthly.

Charges to these control accounts originate from the following; payroll distribution, sales register, cash book, voucher register and journal.

Accounting Code: (Form Nos. 22-23-24)—A complete accounting code for the necessary general ledger accounts is shown on forms Nos. 22, 23 and 24. The expense ledger accounts are detailed accounts appearing on the monthly forms of statements of various departments.

This briefly outlines our methods used in determining manufacturing expenses. The bulk of the work comes in analyzing and attempting to remedy the unusual conditions as they are reflected in the monthly statements.

FORM No. 22. CHART OF GENERAL LEDGER ACCOUNTS
ASSETS

Accounting Code Number	Current Assets
1	Cash on hand
2	Bank Accounts
3	Petty Cash—Office
4	Branches
5	Securities
6	Accounts Receivable—Wholesale
7	Accounts Receivable—Retail
8	Accounts Receivable—Employees
9	Accounts Receivable—Delinquent
10	Notes Receivable
11	Mortgages Receivable
12	Finished Inventory—Refinery
13	Finished Inventory—Grease Plant
14	Finished Inventory—Branches
15	Barrels, Cans and Containers
16	Crude Oil
17	Raw Materials—Refinery
18	Raw Materials—Grease Plant
19	Supplies—Refinery
20	Supplies—Grease Plant
21	Supplies—Service Department
22	Payroll Advances
23	Insurance Claims
	FIXED ASSETS:
51	Plant Overhead Department
52	Steam Plant
53	Fire Stills
54	Steam Stills
55	Treating Equipment
56	Wax Plant
57	Filter House
58	Plant General
59	Cracking Plant
60	Bright Stock & Sharples Process
61	Grease Plant
62	Warehouse
63	Tank Cars
64	Barges & Docks
65	Tank Trucks
66	Stake Trucks
67	Sales Department
68	General Office
	Deferred Charges:
75	Prepaid Insurance
76	Interest
77	Local Taxes
78	Freight
79	Rentals
80	Auto Licenses
81	Advertising
82	Office Supplies
83	Organization Expenses

FORM No. 23. CHART OF GENERAL LEDGER ACCOUNTS
LIABILITIES

Accounting Code Number	Current
101	Notes Payable
102	Accounts Payable
103	Payrolls
104	Commissions
105	Gasoline Taxes
	Accruals:
111	Interest on Notes Payable
112	Interest on Mortgages
113	Local Taxes
114	State Taxes
	Funded Debt:
131	Mortgages Payable
132	Bonded Debt
133	Notes Payable to Officers
	Reserves:
141	Depreciation: Plant Overhead Dept.
142	" Steam Plant
143	" Fire Stills
144	" Steam Stills
145	" Treating Equipment
146	" Wax Plant
147	" Filter House
148	" Plant General
149	" Cracking Plant
150	" Bright Stocks & Sharples Plant
151	" Grease Plant
152	" Warehouse
153	" Tank Cars
154	" Barges & Docks
155	" Tank Trucks
156	" Stake Trucks
157	" Sales Department
158	" General Office
159	Accounts Receivable (Doubtful)
160	Contingencies
	Capital Accounts:
171	Capital Stock Issued
172	Earned Surplus
173	Capital Surplus
174	Profit & Loss Account
175	Dividends Paid

FORM NO. 24 INCOME ACCOUNTS
CHART OF GENERAL LEDGER ACCOUNTS
REFINERY SALES

Accounting Code Number	
201	Gasoline Motor
202	WOW
203	Ethyl
204	Kerosene
205	Fuel Oil
206	Viscous Neutral
207	Non-Viscous
208	Black Oils
209	Wax Distillate
210	Paraffin Wax
211	Bright Stock
	GREASE PLANT SALES
301	Green Lubricant
302	Thin-Thick
303	Cup Greases
304	Set Greases
305	Mine Car Greases
306	Tallow Compound
307	Fibre Greases
308	Pittroil
309	Hot Neck Grease
310	Soaps
	MISCELLANEOUS INCOME
401	Interest Earned
402	Cash Discounts Earned
403	Rentals
404	Branch Profit or Loss
405	Miscellaneous
	MISCELLANEOUS EXPENSES
451	Interest on Notes
452	Interest on Mortgages
453	Reserved for Bad Debts
454	Miscellaneous
455	Reserved for Federal Income Taxes
	EXPENSE ACCOUNTS
500	Plant Overhead
600	Steam Plant
700	Fire Stills
800	Steam Stills
900	Treating
1000	Wax Plant
1100	Filter House
1200	Plant General
1300	Cracking Plant
1400	Bright Stock and Sharples
1500	Grease Plant
1600	Warehouse
1700	Tank Cars
1800	Barges
1900	Tank Wagons
2000	Stake Trucks
2100	Selling
2200	General and Administrative.

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Refinery - Tank Wagon Markets

National Petroleum News

Prices of Light Products Advance In Mid-Continent Markets

Staff Special
TULSA, April 28

GENERAL improvement in both demand and prices of light oils was noted in the Mid-Continent the last week of April. Exporters bought gasolines whenever they could obtain the goods at their offered prices. One export company advanced its offer for 64-66, 375 end point gasoline 0.125 cent to 7.50 cents a gallon, and bought approximately 3,000,000 gallons at that figure. Jobbers and resale buyers took more interest in buying for deferred shipment, and one large company in Texas bought approximately 1,250,000 gallons of U. S. Motor for delivery over early May.

Natural gasolines experienced the buying lull usually near the end of the month and prices lost a little ground. Kerosenes were in better demand in all areas and prices moved fractionally higher. Stove distillates were quiet. Gas oils were in demand in Texas for export, with two cargoes reported bought for export. Fuel oils were generally unchanged in prices with demand reported slow in many quarters.

Gasolines

Refiners that make naphthas and the 450 e. p. gasolines, kept their production moving steadily all week. Naphthas especially were in demand and prices moved up 0.125 cent a gallon.

Sale of 1,000,000 gallons of 58-60 U. S. Motor for export was made by an Oklahoma refiner early in the week at approximately 6.75 cents a gallon. Another refiner sold between 800,000 and 900,000 gallons of 60-62, 400 e. p. gasoline for 7 cents a gallon, and late in the week another refiner sold 250,000 gallons of 61-63, 390 e. p. gasoline for export at 7.25 cents a gallon, the goods to be shipped in May.

Several refiners reported resale buyers had been active all week. A few sales were reported, lots ranging from 10 to 50 cars each. Some of the purchases were for future shipment. Jobbers also increased their future delivery orders. Refiners said gasolines also were being ordered in good volume on contracts.

Two or three refiners advanced their quotations for U. S. Motor and the other grades of gasolines 0.125 cents. One refiner moved his price for U. S. Motor from 6.875 cents to 7 cents, and then to 7.125 cents.

The Sinclair Refining Co. early in the week offered 7.50 cents a gallon for 64-66, 375 e. p. gasoline, f.o.b. north Texas plants. This advance of 0.125 cent a gallon enabled the company to buy approximately 2,000,000 gallons in north Texas, and 1,000,000 gallons in Oklahoma. The company's buyers were seeking gasolines as late as April 28, with indications they would be in the market next week.

Natural Gasolines

The slight recession in prices of natural gasolines was expected in many quarters. A majority of manufacturers complete their contract shipments by the 22nd of each month and unless an unusually large amount of new buying comes in the last week for both spot and over the next month delivery, movement of goods slackens.

Inquiries were reported fair by most manufacturers, and some contracts for over May were being closed the last two or three days of this week. Some of the contracts were on market-date-of-shipment basis, while others were at flat prices running 0.25 to 0.50 cent above present price levels.

Kerosenes

Advances of 0.125 to 0.25 cent a gallon for 41-43 water white kerosene were made by several Oklahoma refiners early in the week. While kerosenes were in little demand in Oklahoma late in the week ended April 21, confirmation April 23 of the sale of approximately 250,000 gallons for export by one of the larger companies, and an increased demand because of better weather in much of the farming belt of the middle west, put new life into this commodity. The price of 41-43 w.w. grade broke away from a flat 5 cents a gallon. The price April 28 was 5 to 5.25 cents a gallon. Price of 42-44 w.w. grade was pegged at 5.50 cents a gallon with goods scarce.

Texas refiners continued to supply not only their Texas trade, but also much of the trade in the southeast. A majority of refiners said they were behind on shipments with more orders coming in daily. The Louisiana and Arkansas refiners also are behind on shipments and one or two of them continued to pass what orders they could on to Texas refiners.

Kansas refiners enjoyed a good week with their kerosenes moving well. Demand was heavier in some quarters than production and some outside buying was being done by these refiners.

Distillates, Gas Oil

No changes were noted in either price of or demand for stove distillates. Gas oils were in good demand in Oklahoma at unchanged price levels. Inquiries were numerous late in the week for goods to be shipped during May. These inquiries were both from industrial gas companies and from a few refiners who will crack the goods.

Two cargoes of gas oil were reported bought in north Texas, with the result that little goods can be obtained for spot shipment. One cargo was reported bought for 2.375 cents a gallon, while the other was bought for 2.50 cents a gallon.

Arkansas and Louisiana refiners have experienced a better demand, and prices have moved up slightly. The demand was primarily from the rice growers.

Fuel Oils

Inquiries for fuel oils for May delivery have not been so good as expected in many quarters. Spot demand also has slackened somewhat and prices April 28 were approxi-

Refinery Markets on Light Oils and Lubricants

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

	Prices Apr. 30	Prices Apr. 23	Prices Apr. 16
PENNSYLVANIA			
52-54 Naphtha	8.50 – 9.50	8.25 – 8.75	8.25 – 8.50
54-56 Naphtha	8.75 – 9.625	8.50 – 9.00	8.50 – 9.00
58-60 U.S. Motor 437 e.p.	9.00 – 9.50	9.00 – 9.25	8.50 – 9.25
60-62 400-410 e.p. gasoline	9.75 –10.00	9.25 –10.00	9.00 – 9.75
64-66 390 e.p. gasoline	10.00 –10.50	9.75 –10.50	9.50 –10.00
68-70 Str.-run gas. 350-360 e.p.	11.00 –11.50	10.50 –11.50	10.25 –11.00
OKLAHOMA			
48-50 450 e.p. naphtha	†6.50 – 6.75	†6.375– 6.50	†6.375– 6.50
50-52 450 e.p. naphtha	†6.50 – 6.75	†6.375– 6.50	†6.375– 6.50
56-58 450 e.p. gasoline	6.50	6.50	6.375– 6.50
58-60 450 e.p. gasoline	6.625	6.50 – 6.625	6.50
64-66 390 e.p. gasoline	7.25 – 7.375	7.00 – 7.125	6.875
68-70 350-360 e.p. gasoline	7.50	7.375– 7.50	7.125– 7.375
OKLAHOMA (Weighted Average Prices)			
58-60 U. S. Motor, 437 e.p.	6.9459	6.8441	6.8003
60-62 437 e.p. gasoline	7.0000	6.8690	6.9444
60-62 400 e.p. gasoline	7.0833	7.0719	6.9007
64-66 375 e.p. gasoline	7.3625	7.2500	7.1563

Above are weighted average prices, current week's prices being effective on Saturday, instead of Monday, the last day on which weighted averages are available for publication in this table. Weighted average prices for the current Monday are published on page 37 of this issue. The two previous week's prices shown are corrected to show Monday's prices, effective on the dates shown at the top of the columns.

KANSAS* (F. O. B. refinery Kansas destination)			
58-60 U.S. Motor 437 e.p.	7.125	6.875– 7.00	6.875– 7.00
60-62 400 e.p. gasoline	7.375	7.25	7.25
64-66 375 e.p. gasoline	7.75	7.50	7.50
NORTH TEXAS			
48-52 450 e.p. naphtha	†6.50	†6.50	†6.25 – 6.50
56-58 450 e.p. gasoline	†6.50 – 6.625	†6.50	†6.25 – 6.50
58-60 450 e.p. gasoline	†6.50 – 6.625	†6.50	†6.375– 6.50
58-60 U.S. Motor 437 e.p.	**7.00 – 7.125	**6.875– 7.125	6.75
60-62 400 e.p. gasoline	7.25	7.125– 7.25	6.875– 7.00
64-66 390 e.p. gasoline	7.25 – 7.375	7.25	7.00 – 7.125
64-66 375 e.p. gasoline	7.50 – 7.625	7.375	7.25 – 7.375
68-70 350-360 e.p. gasoline	7.625	7.50	7.375– 7.50
NORTH LOUISIANA (N. La., Ark. and Miss. destination)			
58-60 U.S. Motor gasoline	7.50	7.25	7.25
ARKANSAS (Arkansas destination only)			
56-58 450 e.p. gasoline	6.75	6.50	6.50
58-60 450 e.p. gasoline	7.00	6.75	6.75
58-60 U.S. Motor 437 e.p.	7.50	7.25	7.25
CALIFORNIA			
*54-58 U.S. Motor 437 e.p.	9.00 –12.50	8.00 –11.00	8.00 –11.00
*58-60 U.S. Motor 437 e.p.	10.00 –13.00	10.50 –11.50	10.50 –11.50
*42-45 Eng. dis. 445-480 e.p.	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00

*3c tax to be added if used in state.

NATURAL GASOLINE

(Note: End point of all grades, not over 375 F. Since Oct. 1, 1927 naturals must pass corrosion test.)

OKLAHOMA			
Grade AA, 80-87.9, 90% Recovery	†6.00 – 6.25	†6.25 – 6.375	5.25 – 5.50
Grade A, 72-79.9, 90% Recovery	†6.00 – 6.25	†6.25 – 6.375	5.25 – 5.50
Grade BB, 84-92, 85% Recovery	†5.50	†5.25 – 5.75	4.375– 4.50
Grade B, 76-83.9, 85% Recovery	†5.50	†5.25 – 5.75	4.375– 4.50
Grade C, 80-92, 78% Recovery	†5.00 – 5.25	†5.25	4.25
NORTH TEXAS (F. O. B. Breckenridge)			
Grade AA, 80-87.9, 90% Recovery	†6.125– 6.25	†6.25 – 6.375	5.25 – 5.50
Grade A, 72-79.9, 90% Recovery	†6.125– 6.25	†6.25 – 6.375	5.25 – 5.50
Grade BB, 84-92, 85% Recovery	†5.375– 5.50	†5.25 – 5.75	4.375– 4.50
Grade B, 76-83.9, 85% Recovery	†5.375– 5.50	†5.25 – 5.75	4.375– 4.50
Grade C, 80-92, 78% Recovery	†5.125– 5.25	†5.25	4.25
NORTH LOUISIANA (F. O. B. Monroe District)			
Grade AA	†6.25 – 6.50	†6.625– 6.875	†5.50 – 5.75
Grade BB	†5.75 – 5.875	†6.00 – 6.25	†4.50 – 4.75
Grade C	†5.50 – 5.625	†5.75	†4.25 – 4.50
CALIFORNIA			
75-85, 375-390 e.p. blend	8.00 – 9.00	8.50 – 9.50	8.50 – 9.50

MOTOR FUEL BLENDS

PENNSYLVANIA			
68-70 Blend 437 e.p.	Prices	.....	.....
64-66 Blend 437 e.p.	Temporarily	.....	.....
60-62 Blend 437 e.p.	Discontinued	.....	.....
OKLAHOMA			
64-66 Blend 437 e.p.	†6.50 – 6 625	†6.50	†6.375– 6.50

BURNING OILS

PENNSYLVANIA			
45 w.w. kerosene	6.50 – 7.00	6.50 – 6.75	6.375– 6.50
46 w.w. kerosene	7.00 – 7.50	6.75 – 7.25	6.625– 7.00
47 w.w. kerosene	7.25 – 7.75	7.00 – 7.50	6.875– 7.25
300 mineral seal	7.50 – 7.75	7.50 – 7.75	7.25 – 7.50
OKLAHOMA			
41-43 w.w. kerosene	5.00 – 5.25	5.00	5.00
42-44 w.w. kerosene	5.50	5.375– 5.50	5.25 – 5.50
KANSAS (F. O. B. refinery Kansas destination)			
41-43 w.w. kerosene	5.375	5.25 – 5.375	5.25 – 5.375
42-44 w.w. kerosene	5.625 – 5.75	5.50 – 5.625	5.50 – 5.625
NORTH TEXAS			
40-42 w.w. kerosene	†4.75	†4.625	†4.50 – 4.625
41-43 w.w. kerosene	†5.00	†5.00	†4.75 – 5.00
NORTH LOUISIANA (N. La. Ark. and Miss. destination)			
41-43 w.w. kerosene	5.25 – 5.50	5.25 – 5.50	5.25 – 5.50
ARKANSAS (Arkansas destination only)			
42-44 kerosene	5.50	5.50	5.50
CALIFORNIA			
38-40 w.w. kerosene	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50

NEUTRAL OIL

Vis.			
PENNSYLVANIA	**(Viscosity at 70°F.)**		
200 No. 3 Assoc. Filt.	33.50 –34.00	33.50 –34.00	33.00 –34.00
180 No. 3 Assoc. Filt.	31.50 –32.00	30.50 –31.50	30.50 –31.50
150 No. 3 Assoc. Filt.	27.00 –28.00	27.00 –27.50	27.00 –27.50
	(Non Viscous)		
34 Grav. 330-340 Flash	7.50 – 8.00	7.00 – 8.00	7.00 – 8.00
36 Min. Neut. 300-305 Flash	6.50 – 7.75	6.50 – 7.50	6.50 – 7.50
****OKLAHOMA**			
Vis. Color	**(Viscosity at 100°F.)**		
100—No. 2	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
150—No. 3	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
150—No. 4	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
180—No. 3	9.00 –10.00	9.00 –10.00	9.00 –10.00
180—No. 4	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
180—No. 5	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
200—No. 3	9.625–11.00	9.625–11.00	9.50 –11.00
200—No. 4	9.50 –10.75	9.50 –10.75	9.50 –10.75
200—No. 5	9.00 –10.50	9.00 –10.50	9.00 –10.50
220—No. 3	12.50 –13.50	12.50 –13.50	12.50 –13.50
220—No. 4	12.25 –12.50	12.25 –12.50	12.25 –12.50
220—No. 5	11.50 –12.00	11.50 –12.00	11.50 –12.00
240—No. 3	13.50 –14.00	13.50 –14.00	13.50 –14.00
240—No. 4	13.25 –13.50	13.25 –13.50	13.25 –13.50
240—No. 5	12.00 –13.00	12.00 –13.00	12.00 –13.00
280—No. 3	15.50 –16.50	15.50 –16.50	15.50 –16.50
280—No 4	15.25	15.25	15.25
280—No. 5	14.00 –15.00	14.00 –15.00	14.00 –15.00
300—No. 5-6	17.00	17.00	17.00
GULF COASTAL			
Vis. Color	**(Viscosity at 100°F., pour test 0)**		
100—No. 2 Unfilt. Pale	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50
200—No. 3 Unfilt. Pale	9.50 –10.25	9.50 –10.25	9.50 –10.25
300—No. 3 Unfilt. Pale	10.50 –11.25	10.50 –11.25	10.50 –11.25
500—No. 3½ Unfilt. Pale	12.50 –13.25	12.50 –13.25	12.50 –13.25
750—No. 4 Unfilt. Pale	14.50 –15.50	14.50 –15.50	14.50 –15.50
200—No. 5½ Red Oil	7.50 – 8.25	7.50 – 8.25	7.50 – 8.25
300—No. 5½ Red Oil	8.75 – 9.25	8.75 – 9.25	8.75 – 9.25
500—No. 6 Red Oil	10.00 –10.50	10.00 –10.50	10.00 –10.50
750—No. 6 Red Oil	12.75 –13.50	12.75 –13.50	12.75 –13.50
CALIFORNIA			
Vis. Color	**(Viscosity at 100°F.)**		
100—No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
200—No. 3	11.50 –12.00	11.50 –12.00	11.50 –12.00
300—No. 3	13.00 –13.50	13.00 –13.50	13.00 –13.50
450—No. 3–3½	15.50 –16.00	15.50 –16.00	15.50 –16.00
550—No. 3–3½	16.50 –17.00	16.50 –17.00	16.50 –17.00
600—No. 3–3½	17.00 –17.50	17.00 –17.50	17.00 –17.50
200—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
300—No. 5	12.00 –12.50	12.00 –12.50	12.00 –12.50
400—No. 5	14.00 –14.50	14.00 –14.50	14.00 –14.50
500—No. 5	15.00 –15.50	15.00 –15.50	15.00 –15.50
600—No. 5	16.00 –16.50	16.00 –16.50	16.00 –16.50
700—No. 7	18.00 –18.50	18.00 –18.50	18.00 –18.50

CYLINDER STOCKS

****OKLAHOMA**			
190-200 Vis. at 210° Brt. St.	31.00 –32.00	31.00 –32.00	31.00 –32.00
150-160 Vis. at 210° Brt. St.	21.00 –24.00	21.00 –24.00	21.00 –24.00
600 E St. 140-150 Vis.-210°	17.00 –18.00	17.00 –18.00	17.00 –18.00
600 St. Ref. Olive Green	8.50 –10.00	8.50 –10.00	8.50 –10.00
600 St. Ref. Dark Green	6.50 – 8.00	6.50 – 8.00	6.50 – 8.00
Black Oil	5.00	5.00	5.00
PENNSYLVANIA	**(1-inch Immersion Test)**		
600 Steam Refined	9.50 –11.00	9.25 –11.00	9.25 –10.50
650 Steam Refined	11.00 –13.00	10.50 –12.50	10.50 –12.50
600 Flash	14.00 –17.00	14.00 –16.50	14.00 –16.50
625 Flash	24.00 –28.00	24.00 –27.50	24.00 –27.50
600 Warren E	15.50 –17.00	16.00 –17.00	15.50 –17.00
600 Oil City E	14.50 –16.50	15.00 –16.50	15.00 –16.25
600 D Filtered	22.00 –23.50	22.00 –23.50	22.00 –23.50
Cold Test Stock, 40-50 p. p., 140-150 vis. at 210°, 540-550 flash, No. 8 color	28.00 –29.00	28.00 –28.50	27.00 –28.00
40-50 p.p., 140-150 vis. at 210°, 540-550 flash, No. 6-6½ color diluted	25.50 –27.00	25.50 –27.00	25.00 –26.00

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon higher)

†PRICES NOMINAL ††ONLY ONE REFINER QUOTING *QUOTATIONS ONLY **REPRESENTS BOTH SALES AND QUOTATIONS

That impression of efficiency

When motorists drive up to your filling station are they served by neat appearing attendants?

Add to your service that one touch that makes it complete. Have your men uniformed — "Well dressed for work."

Standard Work Garments are made of the finest materials — triple stitched and reinforced — made to look right and wear right.

Standard Work Garments

$3.25 each

15% off in dozen lots. Special Prices in larger quantities.

Choice of blue denim, white, hickory stripe, express stripe, fancy blue and gold stripe. Union Made. Name or trade-mark embroidered in fast colors for 25c per garment.

The Standard Garment Co.

Toledo, Ohio

The motorist *remembers* a clean filling station

HE MAY forget all about a dirty filling station, but not a clean, attractive-looking one. He remembers — and comes back again.

It's easy to spruce things up with the help of an Oakite cleaning solution. Pumps, oil bottles and service cans are quickly brightened up; dirty, oily accumulations removed from concrete driveways. Oakite cleaning renews painted surfaces, too, and makes windows glisten.

Write for booklet telling how to make easy work of all your cleaning. Sent on request.

Oakite Service Men, cleaning specialists, are located in leading industrial centers of U. S. and Canada.

Oakite is manufactured only by

OAKITE PRODUCTS, INC.

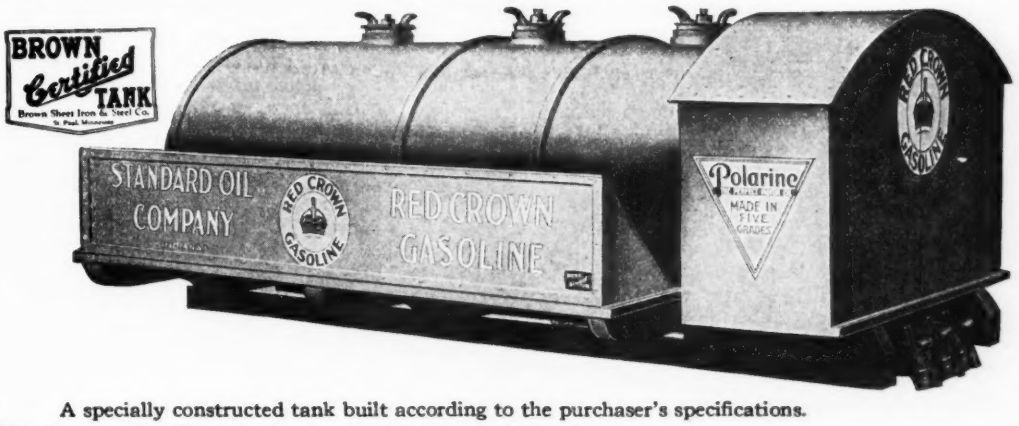
42C Thames St., New York, N. Y.

OAKITE

Industrial Cleaning Materials and Methods

WHY A BROWN TANK IS CERTIFIED OIL-TIGHT

First—Over 15 years of practical experience in building.
Second—Guaranteed Thickness Material of proper analysis.
Third—Correct design to handle the load.
Fourth—They are built the right way not the cheapest way.



Through many years of experience in building oil equipment, we know your problems in every detail.

Our exceptional manufacturing facilities enable us to give the best kind of service.

A specially constructed tank built according to the purchaser's specifications. The Standard Oil Company have several hundred of these in service.

BROWN SHEET IRON & STEEL CO. **ST. PAUL, MINN.**

— — — — — — — *Tear out this coupon and mail it to-day* — — — — — — —

We are interested in your tanks. Send your catalog and prices.

Make of Truck..... Year..... We operate..... (number) Tank Trucks.

Other equipment on which you may send prices.....

Name..... Address.....

Refinery Markets on Wax and Heavy Oil Products

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annual

WAX

PENNSYLVANIA	Prices Apr. 30	Prices Apr. 23	Prices Apr. 16
Per Pound, New York			
122-124 white crude scale	3.75 – 4.00	3.50 – 3.75	3.50
124-126 white crude scale	3.75 – 4.00	3.50 – 3.75	3.50
****OKLAHOMA**			
124-126 White Crude Scale	3.50 – 3.75	3.00 – 3.25	3.00 – 3.25
CALIFORNIA			
White crude scale, per pound, ton lots	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50

FUEL OIL

PENNSYLVANIA			
36-40 fuel oil	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
30-34 fuel oil	4.75 – 5.00	4.75 – 5.00	4.875– 5.25
28-32 fuel oil	4.75 – 5.00	4.75 – 5.00	4.875– 5.00
OKLAHOMA			
38-40 straw distillate	3.00 – 3.125	3.00 – 3.125	3.00 – 3.125
36-38 straw distillate	3.00	3.00	3.00
32-36 gas oil, straw	†2.625– 2.75	†2.625– 2.75	†2.625– 2.75
32-36 dark gas oil	2.625	2.625	2.625
28-30 fuel oil (in bbls.)	$0.90 – 0.975	$0.95 – 1.00	$0.95 – 1.00
26-28 fuel oil (in bbls.)	$0.875– 0.90	$0.875– 0.925	$0.90 – 0.925
24-26 fuel oil (in bbls.)	**$0.80– 0.85	**$0.85– 0.875	**$0.85– 0.90
22-26 fuel oil (in bbls.)	**$0.775–0.80	**$0.775–0.825	**$0.80– 0.825
18-22 fuel oil (in bbls.)	**$0.75– 0.775	**$0.775–0.80	**$0.80
16-18 fuel oil (in bbls.)	**$0.75	**$0.775–0.80	**$0.80
14-16 fuel oil (in bbls.)	**$0.75	**$0.775–0.80	**$0.80

Note: Zero cold test low flash gas oils sell for ½ cent more per gallon. Zero cold test fuel oils sell for 5 to 10 cents more per bbl.

KANSAS *(F. O. B. refinery Kansas destination.)			
38-40 straw distillate	3.25 – 3.50	3.25 – 3.50	3.25 – 3.50
36-38 straw distillate	3.00	3.00	3.00
32-36 gas oil	2.875	2.875	2.875
24-26 fuel oil	$0.90 – 1.00	*$0.90– 1.00	*$0.85
18-22 fuel oil	$0.80 – 0.85	*$0.85	*$0.90– 1.00
NORTH TEXAS			
38-40 straw distillate	3.00	3.00	3.00 – 3.125
32-36 gas oil, cracked	2.50	2.375– 2.50	2.375
32-36 gas oil, uncracked	2.50	2.375– 2.50	2.375– 2.50
24-26 fuel oil (in bbls.)	$0.725– 0.775	$0.775– 0.80	$0.775– 0.80

GULF COASTAL	Prices Apr. 30	Pr Ap	Prices Apr. 16
Fuel (in bbls.)	$1.40 –$1.50	$1.40	$1.40 –$1.50
Gas oil	4.375– 4.50	4.375–	4.375– 4.50
NORTH LOUISIANA (N. La., Ark. and Miss			ion)
32-36 gas oil, dark	2.625– 2.75	2.625–	2.625– 2.75
32-36 gas oil, straw	2.75 – 3.00	2.75 – .0	2.75
16-20 fuel oil (in bbls.)	$0.85	$0.85 - .0	$0.85 – 0.90
ARKANSAS (Arkansas destination only)			
32-36 gas oil, straw	3.00 – 3.25	3.00 – 3 .5	3.00 – 3.25
32-36 gas oil	2.75 – 3.00	2.75 –	2.75 – 3.00
28-32 gas oil	2.75	.2	2.75
Road Oil	$1.15	.1.	$1.15

CALIFORNIA* (F. O. B. San Joaquin Valley. A· , Francisco, 4c per bbl. more)

14-18 fuel oil (in bbls.)	$0.70 –$0.80	$0.70 -	$0.70 –$0.80
14-18 Bunker oil (in bbls.)	$0.80 –$1.00	$0.8(	$0.80 –$1.00
30-34 gas oil (in bbls.)	$1.05 –$1.10	$1.0	$1.05 –$1.10
27 Plus Diesel oil (in bbls.)	$0.90 –$1.00	$0.9(	$0.90 –$1.00

PETROLATUMS

PENNSYLVANIA (In barrels, carload lots, f.o.b. re· ·ry. ⅝c to ¾c per pound less.)			In tank cars
Snow White	8.00 – 8.125	8.00 – 8.375	7.75 – 8.375
Lily White	7.00 – 7.125	7.00 – 7.375	6.75 – 7.375
Cream White	6.00	6.00 – 6.375	5.75 – 6.375
Blonde	...‡	4.50	4.50
Light Amber	3.25	3.25 –	3.00 – 3.625
Amber	3.00	3.00 –	2.75 – 3.375
Red	2.75	2.75 – .25	2.50 – 3.125
Green No. 5 color	...‡	.5	2.50

‡No refiner quoting.

**PETROLEUM COKE

OKLAHOMA

(Per ton in car lots)

Lump	$4.50 –$5.00	$4.50 –$5.00	$4.50 –$5.00
Still run	$2.75 –$3.00	$2.75 –$3.00	$2.75 –$3.00
Breeze	$1.75 –$2.00	$1.75 –$2.00	$1.75 –$2.00

†PRICES NOMINAL **††ONLY ONE REFINER QUOTING** ***QUOTATIONS ONLY** ****REPRESENTS BOTH SALES AND QUOTATIONS**

mately 2.5 cents a barrel lower than they were April 21.

Refiners report that customers who have fuel contracts based on the price of crude are taking out as much as possible at present, probably because of the persistent rumors of a crude oil price advance in the near future.

Neutral Oils, Cylinder Stocks

Demand for Oklahoma neutral oils and cylinder stocks was good all week. Prices were unchanged.

Wax

The stronger wax market in the east has had its effect in Oklahoma. Sales of 124-125 white crude scale wax were made during the week of April 16 to 21 at 3 to 3.25 cents a pound. Before the end of this week, however, virtually every refiner making wax said he was sold up for May. One or two said they had a little wax but were quoting 3.50 to 3.75 cents a pound. One refiner said his last sale was at 3.50 cents a pound in tank cars. He said he had one more car to sell and was asking 4 cents a pound.

TULSA—P. W. Fusselman, 616-617 McBirney building, Tulsa, has incorporated the Frussco Oil Co., of which he is president. The new company has 31 producing wells.

Week's Price Changes Tank Wagon Markets

Gasoline Changes

Standard of New Jersey—T.w. and s.s. prices gasoline advanced 2 cents, Parkersburg, to 20 cents and 23 cents respectively, including 4 cent state tax, **April 20.**

T.w. and s.s. prices gasoline advanced 2 cents, Richmond, to 21 cents and 24 cents respectively, including 5 cent tax, **April 18.**

Advances at other Virginia and West Virginia points where prices were below normal were made on April 18 and April 20 respectively, bringing t.w. price at all points to 16 cents, without tax.

Standard of Kentucky—T.w. price only of gasoline advanced 1 cent, Louisville and Covington, to 19 cents and 20 cents respectively, including 5 cent state tax, **April 26.** S.s. prices unchanged. T.w. price advanced 2 cents, s.s. price 1 cent, Lexington, to 20 cents and 22 cents respectively, including tax, **April 26.**

Standard of Indiana—T.w. and s.s. prices gasoline advanced 2 cents, St. Joseph, to 16.5 cents and 18.5 cents respectively, including 2 cent state tax, **April 25.**

Standard of California—T.w. and s.s. prices gasoline reduced 7 cents, Phoenix, to 16 cents and 20 cents respectively including 4 cent state tax, **April 11.**

Locke Adds to His Laurels

CHICAGO, April 28.—George D. Locke, vice president of the Barnsdall Refining Co. in charge of marketing, has added a new distinction. He once played in a band in a small country town. He finally was elected mayor of the same small town, which is some comment as to his playing, although it is reported that it was a bass drum that he performed on. He later became a high officer of the Elks and a few other things. But now he has a grandson, George D. Locke II, son of his boy Lucien P. Locke, of Erwin, Wasey & Co., advertising agents, Chicago.

TULSA—The Natural Gas Equipment Co., of Los Angeles, has opened a Mid-Continent office in the Atco building, Tulsa, with William Chase as resident manager. The company is distributor for Wilgus regulators, National gas burners, National liquid level controls and Thomas gas lift control. V. E. Ready has come to Tulsa from Los Angeles as sales representative and the office management is in charge of George Chase.

Tank Wagon, Service Station Markets for Gasoline and Kerosene

(OIL PRICE HANDBOOK has t.w. and s.s. markets for 1927, 1926, 1925, 1924 arranged for quick reference)

...se Prices in Effect April 30, 1928, as Posted by Principal Marketing Companies

S.O. NEW J... Y TERRITORY

	Gasoline Tax	Gasoline Total T.W.	Gasoline Total S.S.	Oil T.W.
Atlantic City, N.	2	18	20	14
Newark, N. J.	2	18	20	14
Annapolis, Md.	4	20	23	14
Baltimore, Md.	4	20	23	12
Cumberland, Md.	4	20	23	14
Washington, D. C.	2	18	21	14
Danville, Va.	5	21	*	14
Norfolk, Va.	5	21	24	14
Richmond, Va.	5	21	24	14
Roanoke, Va.	5	21	24	14
Petersburg, Va.	5	21	24	14
Charleston, W. Va.	4	20	23	14
Keyser, W. Va.	4	20	23	14
Parkersburg, W. Va.	4	20	23	14
Wheeling, W. Va.	4	20	23	14
Charlotte, N. C.	4	20	23	14
Hickory, N. C.	4	20	20	14
Mt. Airy, N. C.	4	20	20	14
Salisbury, N. C.	4	20	20	14
Charleston, S. C.	5	20	23	14
Columbia, S. C.	5	20	23	14

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK

Due to local pr... nditions at many points in S. O. New York ... ry, actual prices on both gasoline and kerosen... being made at under the posted tank wagon p... es published below.

New York City	17	0	17	*19	15
Albany, N. Y.	16	0	16	19	15
Buffalo, N. Y.	16	0	16	19	14
Rochester, N. Y.	16	0	16	19	12
Syracuse, N. Y.	16	0	16	19	15
Boston, Mass.	17	0	17	19	15
Augusta, Me.	17	4	21	23	15
Manchester, N. H.	17	4	21	23	15
Burlington, Vt.	16	3	19	22	15

*The Standard of New York does not operate stations in New York City. This figure is the retail price of a principal station operator selling Socony gasoline.

ATLANTIC REFINING

Pittsburgh, Pa.	16	*	16	*22	13
Philadelphia, Pa.	16	*	16	*22	13
Allentown, Pa.	16	*	16	*22	13
Erie, Pa.	12	*	12	*18	13
Scranton, Pa.	16	*	16	*22	13
Altoona, Pa.	16	*	16	*22	13
Dover, Del.	16	3	19	22	13
Wilmington, Del.	16	3	19	22	12
Providence, R. I.	19	2	21	21	15
Boston, Mass.	19	0	19	19	15
Springfield, Mass.	19	0	19	19	15
Worcester, Mass.	19	0	19	19	15
Hartford, Conn.	19	2	21	21	14
New Haven, Conn.	19	2	21	21	15

*3-cent state tax is collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Lexington, Ky.	15	5	20	22	15.5
Louisville, Ky.	14	5	19	21	15
Covington, Ky.	15	5	20	22	15.5
Clarksdale, Miss.	14	4	18	20	10
Gulfport, Miss.	††15.5	4	††19.5	21.5	14
Jackson, Miss.	14	4	18	20	12
Natchez, Miss.	13.5	4	17.5	19.5	14
Vicksburg, Miss.	13.5	4	17.5	19.5	14
Birmingham, Ala.	16	4	20	22	16
Mobile, Ala.	16	4	20	22	14
Montgomery, Ala.*	17	4	21	23	15.5
Atlanta, Ga.	16	4	20	22	†15
Augusta, Ga.	16	4	20	22	†16.5
Macon, Ga.	16	4	20	22	†16.5
Savannah, Ga.	14	4	18	20	†14.5
Jacksonville, Fla.	14	5	19	21	13.5
Miami, Fla.	16	5	21	23	14.5
Tampa, Fla.	14	5	19	21	13
Pensacola, Fla.	**15	5	**20	22	13

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included. Mobile gasoline prices include 1c city tax.

†Georgia kerosene prices include 1c state tax.

**Both tank wagon prices include 1c city tax at Pensacola, which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

S. O. INDIANA

	Gasoline Tax	Gasoline Total T.W.	Gasoline Total S.S.	Oil T.W.
Chicago, Ill.	14	0	14	16	12
Decatur, Ill.	14.2	0	14.2	16.2	12.1
E. St. Louis, Ill.	13.1	0	13.1	15.35	11.2
Joliet, Ill.	14.4	0	14.4	16.4	12.3
Peoria, Ill.	14.2	0	14.2	16.2	12.1
Quincy, Ill.	14.2	0	14.2	16.2	11.9
Indianapolis, Ind.	14.2	3	17.2	19.2	13.2
Evansville, Ind.	14	3	17	19	13
South Bend, Ind.	14.4	3	17.4	19.4	13.4
Detroit, Mich.	14.8	3	17.8	19.8	13.7
Grand Rapids, Mich.	14.7	3	17.7	19.7	13.6
Saginaw, Mich.	14.9	3	17.9	19.9	13.8
Green Bay, Wis.	14.6	2	16.6	18.6	12.4
Madison, Wis.	14.3	2	16.3	18.3	12.1
Milwaukee, Wis.	14.1	2	16.1	18.1	11.9
La Crosse, Wis.	15.2	2	17.2	19.2	13
Minneapolis, Minn.	14	2	16	18	12.9
Duluth, Minn.	15.5	2	17.5	19.5	12.9
Mankato, Minn.	12.1	2	14.1	16.1	12.7
Des Moines, Ia.	13.5	3	17.5	19.5	12.3
Davenport, Ia.	14.5	3	17.5	19.5	12.3
Sioux City, Ia.	14.1	3	17.1	19.1	11.9
Mason City, Ia.	14.5	3	17.5	19.5	12.3
St. Louis, Mo.	*13.6	2	15.6	17.9	11.3
Kansas City, Mo.	†14.9	2	16.9	18.9	10.6
St. Joseph, Mo.	†14.5	2	16.5	18.5	11.2
Fargo, N. D.	16.9	2	18.9	20.9	14.9
Grand Forks, N. D.	17.2	2	19.2	21.2	15.2
Minot, N. D.	16.9	2	18.9	20.9	14.9
Pierre, S. D.	15.5	4	19.5	21.5	13.9
Huron, S. D.	15.5	4	19.5	21.5	13.9
Wichita, Kans.	12.8	2	14.8	16.8	10.8
Bartlesville, Okla.	12.5	3	15.5	17.5	10 5

S. O. Indiana's quantity discount schedule on tank wagon deliveries of gasoline outside the city of Chicago is 1c for 50 gals. or more at one delivery; 1½c for 6,000 gals. or more a month; 2c for 10,000 gals. or more a month, and 3c for 15,000 gals. or more a month.

In Chicago, above discounts apply, except that minimum required quantity to get the 1c discount is 100 gals., instead of 50 gals. This 1c discount applies on quantities of 100 gals. and over, in addition to regular Q.D.A. discounts applying thru rest of territory, as stated above.

Service station discount is 2c per gal. to consumers of 200 gals. or more a month, or 2400 gals. per year.

Discount on kerosene is 1c on 50 gal. dumps throughout territory.

*Includes city tax of ½c.

†Includes city tax of 1c.

CONTINENTAL OIL

Denver, Colo.	14	3	17	19	14.5
Pueblo, Colo.	14	3	17	19	14.5
Grand Junction, Colo.	17.5	3	20.5	22.5	18
Casper, Wyo.	14	3	17	19	13
Cheyenne, Wyo.	15	3	18	20	14.5
Butte, Mont.	19.5	3	22.5	22.5	19
Helena, Mont.	19.5	3	22.5	24.5	19
Salt Lake City, Utah.	16.5	3½	20	22	17
Boise, Ida.	19.5	4	23.5	25.5	19
Twin Falls, Ida.	19.5	4	23.5	25.5	19
Albuquerque, N. M.	17	5	22	25	17

S. O. CALIFORNIA

Phoenix, Ariz.	12	4	16	20	21.5
Los Angeles, Cal.	13.5	3	16.5	20.5	15.5
Fresno, Cal.	14	3	17	21	16.5
San Francisco, Cal.	14	3	17	21	15.5
Reno, Nev.	18	4	22	26	19
Portland, Ore.	14.5	3	17.5	21.5	16.5
Seattle, Wash.	14.5	2	16.5	20.5	16.5
Spokane, Wash.	18.5	2	20.5	24.5	20.5
Tacoma, Wash.	14.5	2	16.5	20.5	16.5

S. O. LOUISIANA

Little Rock, Ark.	15	5	20	22	12
Alexandria, La.	14	2	16	18	†14
Baton Rouge, La.	13	2	15	17	†12.5
Lake Charles, La.	14.5	2	16.5	18.5	†14
New Orleans, La.	*14.5	2	*16.5	*18.5	†14
Shreveport, La.	14.5	2	16.5	18.5	†13
Lafayette, La.	14	2	16	18	†13.5
Bristol, Tenn.	16	3	19	21	14
Chattanooga, Tenn.	15	3	18	20	15
Knoxville, Tenn.	15	3	18	20	15
Nashville, Tenn.	15	3	18	20	15
Memphis, Tenn.	14	3	17	19	14

*New Orleans gasoline prices include 1c parish tax in addition to 2c state tax, and kerosene prices include 1c state tax and 1c parish tax

†Kerosene price in Louisiana includes 1c state tax.

S. O. OHIO

	Gasoline Tax	Gasoline Total T.W.	Gasoline Total S.S.	Oil T.W.
All Ohio points	14	3	17	19	14

S. O. NEBRASKA

Omaha, Neb.	14.25	2	16.25	18.25	12.25
McCook	14.75	2	16.75	18.75	11.50
Norfolk	14.75	2	16.75	18.75	12.75
North Platte	15.75	2	17.75	18.5	13.50
Scottsbluff	15.25	2	17.25	19.25	13.00

MAGNOLIA PETROLEUM

Muskogee, Okla.	14	3	17	18	11
Oklahoma City	13	3	16	17	11
Tulsa, Okla.	12	3	15	17	11
Fort Smith, Ark.*	15	*3	18	20	12
Little Rock, Ark.	15	5	20	22	12
Texarkana, Ark.*	13	*3	16	20	12
Dallas, Tex.	11	3	14	18	11
Fort Worth, Tex.	12	3	15	18	11
Houston, Tex.	11	3	14	18	15
San Antonia, Tex.	12	3	15	18	10
El Paso, Tex.	14	3	17	20	16

*Within City of Texarkana and Fort Smith, the state tax on gasoline is 3c per gal. conforming with the Texas state tax. In these two districts outside of the city the 5c Arkansas tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M.&.P. Naphtha	Cleaner Naphtha
Chicago	14.7	16.2	18
Detroit	16.4	17.9	19.7
Kansas City	†14.9	†16.4	†18.2
Milwaukee	15.4	*18.9	*20.7
Minneapolis	*18.7	*20.2	*22
St. Louis	14.6	16.1	17.9
New York		19	

*Includes 2c state tax. †Includes 1c city tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

	Gasoline Tax	Gasoline Total T.W.	Gasoline Total S.S.	Oil T.W.
ONTARIO				
Toronto	19.5	3	22.5	26	21
Ottawa	19.5	3	22.5	26	21
Cochrane	24.5	3	27.5	36	26
Ft. William	22.5	3	25.5	29	22.5
MANITOBA					
Winnipeg	21.5	3	24.5	28	21.5
SASKATCHEWAN					
Regina	25.5	0	25.5	30	25.5
ALBERTA					
Edmonton	26.5	3	29.5	33	26.5
Calgary	22.5	3	25.5	29	22.5
BRITISH COLUMBIA					
Vancouver	21	5	26	30	22
QUEBEC					
Montreal	20.5	5	25.5	29	21
Quebec City	22.5	5	27.5	33	23
Three Rivers	22.5	5	27.5	31	23
NEW BRUNSWICK					
St. John	22.5	3	25.5	30	22
Moncton	22.5	3	25.5	30	22
NOVA SCOTIA					
Halifax	22.5	5	27.5	32	22
Sydney	22.5	5	27.5	32	22
PRINCE EDWARD ISLAND					
Charlottetown	22.5	3	25.5	29	22

Note: In districts surrounding these points 1c additional is added to city price.

Above prices include these inspection fees on both gasoline and kerosene, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosene; Colorado, 1/10c on both; Florida, 1, 8c; Indiana, 2/25c; Kansas, 1/50c; Louisiana, 1/32c on gasoline, 1c on kerosene; Minnesota, 3/50c; Missouri, 1/50c; Nebraska, 3/50 to 1/2c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 4/25c; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c on gasoline and 1/2c on kerosene; Wisconsin, 3/50c.

Kerosene inspection fees only: Iowa, 13/100c; Michigan, 1/5 to 4/5c per gal.

In Illinois, cities and villages have the power to appoint oil inspectors and fix inspection fees which is done in some instances. In some cases in the above states or other states there are local inspection fees.

Gulf Export Markets Are Quieter After French Fill Needs

Staff Special
NEW YORK, April 28

GULF export markets slowed up considerably after the heavy buying of last week. The foreign inquiry for light oils was not nearly so active and a temporary lull in what is considered the spot export market, a 60-day period, prevailed this week.

The gasoline purchases made by French buyers, a total of five cargoes for shipment within the next 60 days, has about covered the requirements of French oil companies for the time being, according to the opinions of many suppliers.

There were inquiries in the market this week, but so many strings were attached to them that suppliers felt they were made more in an effort to feel out the market than with the intention of buying.

Most interest in the market centered around the price ideas of various exporters. In other words, the market this week was more largely one of opinions than of actual trading.

In view of the prices at which business was closed last week, several exporters were inclined to reduce their quotations. In the absence of definite buying orders, however, quotations on firm offer were lacking. The opinion was expressed in several quarters that the export market had reached the top, at least temporarily. At least two suppliers were said to have assumed the attitude of "anxious sellers" this week, and the fact that they expressed a willingness to shade their recent quotations for gasoline was regarded as significant.

On the other hand, the fact that one of the largest exporters continued to report a shortage of supplies was taken as a favorable indication by many of the trade. Evidence of this company's position was the purchase last week of a cargo by its foreign subsidiary from an Independent source of supply. The parent company did not compete for the business.

Details surrounding two of the five cargo transactions closed last week did not become known to the trade generally until this week. One large French buyer who was thought to have withdrawn the inquiry he circulated among the trade early last week purchased his requirements April 20. He bought approximately 70,000 barrels of U. S. Motor and 64-66, 375 end point gasoline and prime white kerosene from a leading Independent refiner at 8.375 cents, 9.375 cents and 6.25 cents, respectively. The cargo is for May-June loading. Most suppliers quoted 8.75 cents, 9.50 cents and 6.50 cents, respectively for the business.

The French subsidiary of the same Independent refiner also purchased a mixed cargo from the parent company for late May loading at around the same prices as the foregoing purchase. The deal attracted little interest inasmuch as suppliers were busy at the time figuring on business they felt they had greater chance of getting.

The Scandinavian inquiry for approximately 65,000 barrels of U. S. Motor, 61-63, 390 e.p., and 64-66, 375 e.p. gasoline caused considerable comment this week. The inquiry when it first entered the market made no reference to prices. It was later revised to include only the two lighter grades and a firm offer of 9.0625 cents and 9.3125 cents was requested. The broker negotiating the business was successful in getting the firm offer at these prices. The buyer then revised his bid to 9 cents and 9.25 cents requesting a firm offer at these prices. The inquiry was pending April 28.

One new inquiry was in the market. A French buyer was seeking a 42,000-barrel cargo of U. S. Motor and 64-66, 375 end point gasoline for July-August loading. Reports from the Paris offices of several companies were that the buyer had no intention of closing unless he was convinced the August market was going to be higher.

Suppliers disagreed in their ideas of prices for kerosene. In mixed cargoes, prime white and water white have sold at 6.25 cents and 7.25 cents, respectively, in the past 10 days, whereas the majority of quotations have been 0.25-cent higher. It was generally believed, however, that full cargoes of either grade would be held for the higher prices.

Activity was revived in the gas oil market and three cargoes of goods ranging from 26 to 30 in gravity were reported sold. Prices ranged from 3.875 to 4 cents, although business closed at the latter figure involved a special grade of oil.

Fuel oil prices were without material change. Cargoes of grade C bunker oil were generally offered at $0.90 to $0.95 a barrel. For bunkering, grade C was quoted at $1.05 at New Orleans and 10 cents a barrel higher further west in the Gulf.

Gasoline Prices Advance Further In Atlantic Coast Markets

Staff Special
NEW YORK, April 28

NEW highs for 1928 were recorded for tank car prices of gasoline along the Atlantic seaboard this week. Last week's advance of 0.25-cent to 9.50 cents for May gasoline was followed this week by another 0.25-cent increase.

Although most large jobbers in eastern markets, except New England, are now pretty well covered at 9.50 cents over May, according to the sales heads of large oil companies, 9.75 cents is the new price for additional May or spot business.

Buying over May at 9.50 cents early this week was reported to have been heavy, and the further increase announced by most major companies April 25 only verified predictions made April 21 in many quarters.

A point which the trade viewed with no small amount of satisfaction was the present position of the gasoline market as compared with a year ago. A period of falling markets had been ushered in just previous to this time last year.

May 1, 1927, the tank car price of U. S. Motor gasoline at New York harbor was 8.75 cents, 1 cent below the price now prevailing. Lower prices were in store for the market last year, but this year the trade is predicting a minimum of 10 cents for gasoline in June.

Despite the inclement weather in the seaboard states this week, spot demand from the occasional buyers who had not contracted for their April requirements, was relatively good.

Distress lots of California gasoline in tank cars were offered in the New York market but for the most part this class of goods was absorbed by sellers who were short. A considerable volume of this grade which might have been a disturbing factor in the jobbing market, was taken out of the way by a resale agent at 9.25 cents.

The bulk market for California gasoline continued fairly tight. Prices, laid down New York, based on quotations received from west coast refiners figured 0.50-cent higher than a week ago. Business was closed last

(*Continued on Page* 128)

Complete Seaboard Market

(Export markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the years 1924-1925-1926-1927)

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, represent majority of quotations and sales.)

	Apr. 30	Apr. 23	Apr. 16
U.S. Motor gasoline, New York harbor	9.75	9.50	9.00 – 9.25
U.S. Motor gasoline, Philadelphia	9.50 – 9.75	9.50	8.75 – 9.25
U.S. Motor gasoline, Boston district	*10.25 –10.50	*10.25 –10.50	*10.25 –10.50
U.S. Motor gasoline, Providence district	*10.00 –10.50	*10.00 –10.50	9.50
U.S. Motor gasoline, Baltimore	9.75	9.50	9.00 – 9.25
U.S. Motor gasoline, Norfolk	9.75	9.50	9.25
U.S. Motor gasoline †Wilmington, N. C.	†9.75	9.50	†9.00
U.S. Motor gasoline, Charleston	9.50	9.25	9.00
U.S. Motor gasoline, Savannah	9.00 – 9.25	8.75 – 9.00	8.75
U.S. Motor gasoline, Jacksonville	8.75 – 9.25	8.75 – 9.00	8.50 – 8.75
California U.S. Motor gasoline, New York Harbor	10.00	9.75	9.25
California U.S. Motor gasoline, Baltimore	10.00	9.75	9.25
California U.S. Motor gasoline, Philadelphia	9.50 – 9.75	9.50	9.00 – 9.25
Water white kerosene, New York Harbor	7.00	7.00	7.00
Water white kerosene, Philadelphia	7.25	7.00 – 7.25	7.00
Water white kerosene, Baltimore	7.50	7.50	*7.50
28-34 gas oil, New York harbor	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
28-34 gas oil, Boston district	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
38-42 furnace oil, New York harbor	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
36-40 furnace oil, Boston district	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75
Grade C bunker oil, New York harbor	$1.35	$1.35	$1.35
Grade C bunker oil, Boston district	$1.35	$1.35	$1.35
Diesel oil, New York harbor	$2.00	$2.00	$2.00

Note: Above prices do not include inspection tax levied in some states.

MEDICINAL OILS

Russian 885-890 s.g., 325-330 vis	$0.80 – 0.90	$0.80 – 0.90	$0.80 – 0.90
Russian 870-875 s.g., 150-155 vis	$0.67 – 0.77	$0.67 – 0.77	$0.67 – 0.77
Russian 860-865 s.g., 80-85 vis	$0.65 – 0.75	$0.65 – 0.75	$0.65 – 0.75

***Nominal. †Only one refiner quoting.**

New York Export Market

(Gasoline and kerosene in cases in bulk. Lubricating oils are per gal. in bbls. Cylinder oils are Penna. products.)

	Apr. 30	Apr. 23	Apr. 16
U. S. Motor gasoline	25.40	25.40	25.15
43-45 150 w.w. kerosene	18.40	18.40	18.15
42-44, 110 s.w. kerosene	17.40	17.40	17.15
CYLINDER OILS			
Bright stock, dark	33.00 –34.00	32.50 –33.00	32.50 –33.00
600 D filtered	30.00 –31.00	30.00 –31.00	30.00 –31.00
600 Warren E filtered	23.50 –24.50	23.50 –24.00	23.50 –24.00
600 s.r. unfiltered	17.00	16.75 –17.00	16.75 –17.00
650 s.r. unfiltered	18.25 –19.50	18.25 –19.50	18.25 –19.50
600 flash s.r.	20.50 –21.50	20.00 –21.00	20.00 –21.00
630 flash, s.r.	32.00 –34.00	32.00 –33.00	32.00 –33.00
RED ENGINE OILS (Vis. 100°)			
300 vis. No. 6½ color	19.50 –20.00	20.00	20.00
250 vis. No. 6 color	18.50 –19.00	19.00	19.00
200 vis. No. 6 color	18.00 –18.50	18.50	18.50
PALE ENGINE OILS (Vis. 100°)			
230 vis. No. 3¾ color	24.00	24.00	24.00
180 vis. No. 3¼ color	20.00	20.00	20.00
100 vis. No. 2¼ color	15.75	15.75	15.75
MOTOR OILS (Vis. 100°)			
600 vis. No. 7 color	35.00	35.00	35.00
500 vis. No. 6½ color	33.00	33.00	33.00
400 vis. No. 7¼ color	31.00	31.00	31.00
300 vis. No. 6 color	30.00	30.00	30.00
200 vis. No. 3¼ color	24.00	24.00	24.00
MEDICINAL OILS			
875-885 s.g.	$0.80	$0.80	$0.80
865-870 s.g.	$0.70	$0.70	$0.70

WAXES (In cents per pound, f.a.s. carload lots)

WHITE CRUDE SCALE (In barrels)

	Apr. 30	Apr. 23	Apr. 16
122-124 A.m.p.	3.75 – 4.00	3.625– 3.75	3.375– 3.50
124-126 A.m.p.	3.75 – 4.00	3.625– 3.75	3.375– 3.50
FULLY REFINED (In burlap bags)			
123-125 A.m.p. Phila.	*4.25	*4.25	4.125– 4.25
125-127 A.m.p.	*4.25	*4.25	4.125– 4.25
128-130 A.m.p.	4.25 – 4.50	4.25 – 4.50	4.25 – 4.50
130-132 A.m.p.	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
133-135 A.m.p.	5.50 – 5.75	5.50 – 5.75	5.25 – 5.50
135-137 A.m.p.	6.00 – 6.25	6.00 – 6.25	5.75 – 6.00
YELLOW CRUDE SCALE			
124-126 A.m.p.	3.375– 3.50	3.25 – 3.375	3.125– 3.25

***Prices nominal.**

Gulf Export Market

(Prices are f. o. b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. and over unless otherwise noted, representing sellers' opinions, except those prices specified to the contrary)

GASOLINE	Apr. 30	Apr. 23	Apr. 16
U.S. Motor	*8.625	8.50 – 8.75	8.25
60-62, 400 e.p.	8.875– 9.00	9.00	8.75
61-63, 390 e.p.	9.125– 9.25	9.25	9.00
64-66, 375 e.p.	*9.375	9.50	9.25
U. S. Motor, cases (cargoes)	$1.75	$1.75	$1.75
64-66, cases (cargoes)	$1.85	$1.85	$1.85
KEROSENE			
44 water white	7.25 – 7.50	7.50	7.25
41-43 prime white	6.25 – 6.50	6.50	6.25
Water white, cases (cargoes)	$1.65	$1.65	$1.65
Prime white, cases (cargoes)	$1.55	$1.55	$1.55

***Sales only.**

DOMESTIC GAS & BUNKER OILS			
26-32 translucent gas oil	3.875– 4.00	3.75 – 4.00	3.75 – 4.00
Grade C bunker oil	$1.05 – 1.15	$1.05 – 1.15	$1.05 – 1.15
Grade C bunker oil, cargoes	$0.90 – 0.95	$0.90 – 0.95	$0.90 – 0.95
MEXICAN CRUDE AND BUNKER OILS (F.O.B. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid	$1.05	$1.05	$1.05
Grade C bunker oil, for bunkering purposes, taxes paid	$1.20	$1.20	$1.20

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F.; cold test 0) (Tanker, f.o.b. Houston)

100 vis. No. 2 unfiltered pale	6.00	6.00	6.00
200 vis. No. 3 unfiltered pale	7.75 – 8.00	7.75 – 8.00	7.75 – 8.00
300 vis. No. 3 unfiltered pale	9.25	9.00 – 9.25	9.00 – 9.25
500 vis. No. 3½ unfiltered pale	11.75	11.00 –11.75	11.00 –11.75
750 vis. No. 4 unfiltered pale	12.50 –13.00	12.50 –13.00	12.50 –13.00
1200 vis. No. 5 unfiltered pale	15.50 –16.00	15.50 –16.00	15.50 –16.00
200 vis. No. 5-6 red oil	7.50	7.00 – 7.50	7.00 – 7.50
300 vis. No. 5-6 red oil	8.50	8.00 – 8.375	8.00 – 8.375
500 vis. No. 5-6 red oil	10.00	9.50 –10.00	9.50 –10.00
750 vis. No. 5-6 red oil	11.25 –11.50	11.25 –11.50	11.25 –11.50
1200 vis. No. 5-6 red oil	14.50 –15.50	14.00 –14.50	14.00 –14.50

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	Apr. 30	Apr. 23	Apr. 16
Gasoline, U. S. Motor, 53-55 Gravity	7.50 – 7.75	7.50	7.00 – 7.50
Gasoline, U. S. Motor, blends and special cuts	8.00 – 9.00	8.00 – 9.00	7.50 – 8.50
Gas Oil, 30-34, per barrel	$1.05 –$1.10	$1.05 –$1.10	$1.05 –$1.10
Diesel Oil, 27 plus, per barrel	$0.95 –$1.05	$0.95 –$1.05	$0.95 –$1.05
Bunker oil, 14-18, per barrel	$0.80 –$1.00	$0.80 –$1.00	$0.80 –$1.00
Fuel oil, 14-18, per barrel	$0.75 –$1.00	$0.75 –$1.00	$0.75 –$1.00
Kerosene, 38-40 w.w., 125-150 flash, per gal.	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
Cased Goods			
Gasoline, U. S. Motor	$1.70 –$1.80	$1.70 –$1.80	$1.70 –$1.80
Kerosene, 38-40 w.w., 125-150 flash	$1.35 –$1.45	$1.35 –$1.45	$1.35 –$1.45

Crude Oil Prices, as Posted by Major

(Crude prices for years 1924-1925-1926-1927 in

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$2.80
Bradford District Oil in National Transit Lines (Bradford District)	2.80
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	2.65
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	2.65
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	2.60
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)	2.35
Keister Grade in National Transit Lines (Butler Co)	1.10
Cabell Grade in Eureka Pipe Lines (West Virginia)	1.35
Corning Grade in Buckeye Pipe Lines (Ohio)	1.55
Corning, O. heavy grade	1.45
*Somerset Oil in Cumberland Pipe Lines (Kentucky)	1.45
Ragland Grade in Cumberland Pipe Lines (Kentucky)	.95

*Somerset oil run prior to Oct. 1922, takes price of 6 cents lower than above quotations.

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines $1.50

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Wooster	$1.57	Plymouth	$1.23
Lima	1.55	West Kentucky	1.33
Waterloo	1.20	*Canadian Petro.	1.95
Indiana	1.32	*Oil Springs	2.02
Princeton	1.50	*Posted by Imperial Oil Ltd.	
Illinois	1.50		

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Prairie Oil & Gas Co.

(In Oklahoma, Kansas, North and East Central Texas)

Effective Feb. 21, 1928

28-28.9	$0.96	41-41.9	$1.43
29-29.9	1.01	42-42.9	1.46
30-30.9	1.06	43-43.9	1.49
31-31.9	1.11	44-44.9	1.52
32-32.9	1.16	45-45.9	1.55
33-33.9	1.19	46-46.9	1.58
34-34.9	1.22	47-47.9	1.61
35-35.9	1.25	48-48.9	1.64
36-36.9	1.28	49-49.9	1.67
37-37.9	1.31	50-50.9	1.70
38-38.9	1.34	51-51.9	1.73
39-39.9	1.37	52 and above	1.76
40-40.9	1.40		

Humble Oil & Refining Co. Prices

(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

Effective Feb. 21, 1928

Below 25	$0.76	26-26.9	$0.86
25-25.9	0 81	27-27.9	0.91

Humble Prices (Cont'd)

28-28.9	$0.96	37-37.9	$1.31
29-29.9	1.01	38-38.9	1.34
30-30.9	1.06	39-39.9	1.37
31-31.9	1.11	40-40.9	1.40
32-32.9	1.16	41-41.9	1.43
33-33.9	1.19	42-42.9	1.46
34-34.9	1.22	43-43.9	1.49
35-35.9	1.25	44 and above	1.52
36-36.9	1.28		

Mirando, Tex $1.00

Magnolia Petroleum Co.

(In Oklahoma, Kansas and North and East Central Texas)

Feb. 21, Magnolia posted in above fields and in Panola Co., same schedule as Prairie, except these grades, unchanged from Feb. 16:

Below 30	$0.75
30-30.9	0.90
31-31.9	1.05
Glasscock and Howard Counties	$0.60
Chalkfield (Howard Co.)	$0.80
Iatan district	$0.93
Corsicana heavy	$1.00

Carter Oil Co.

(Oklahoma and Kansas)

Feb. 21, same schedule as Prairie plus these grades:

24-24.9	$0.76	26-26.9	$0.86
25-25.9	0.81	27-27.9	0.91

PANHANDLE, TEXAS

Humble Oil & Refining Co.

Effective Feb. 21, 1928

Hutchinson and Carson Counties:

Below 31	$0.60	38-38.9	$0.88
31-31.9	0.65	39-39.9	0.91
32-32.9	0.70	40-40.9	0.94
33-33.9	0.73	41-41.9	0.97
34-34.9	0.76	42-42.9	1.00
35-35.9	0.79	43-43.9	1.03
36-36.9	0.82	44 and above	1.06
37-37.9	0.85		

Wheeler County:

Below 29	$0.60	37-37.9	$0.95
29-29.9	0.65	38-38.9	0.98
30-30.9	0.70	39-39.9	1.01
31-31.9	0.75	40-40.9	1.04
32-32.9	0.80	41-41.9	1.07
33-33.9	0.83	42-42.9	1.10
34-34.9	0.86	43-43.9	1.13
35-35.9	0.89	44 and above	1.16
36-36.9	0.92		

Gray County:

Below 27	$0.60	36-36.9	$1.02
27-27.9	0.65	37-37.9	1.05
28-28.9	0.70	38-38.9	1.08
29-29.9	0.75	39-39.9	1.11
30-30.9	0.80	40-40.9	1.14
31-31.9	0.85	41-41.9	1.17
32-32.9	0.90	42-42.9	1.20
33-33.9	0.93	43-43.9	1.23
34-34.9	0.96	44 and above	1.26
35-35.9	0.99		

WEST TEXAS

Humble Oil & Refining Co.

Effective Aug. 23, 1927

Crane, Upton, Crockett and Pecos Counties ... $0.60

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton and De Soto

Effective Feb. 21, 1928

Below 28	$0.91	40-40.9	$1.40
28-28.9	0.96	41-41.9	1.43
29-29.9	1.01	42-42.9	1.46
30-30.9	1.06	43-43.9	1.49
31-31.9	1.11	44-44.9	1.52
32-32.9	1.16	45-45.9	1.55
33-33.9	1.19	46-46.9	1.58
34-34.9	1.22	47-47.9	1.61
35-35.9	1.25	48-48.9	1.64
36-36.9	1.28	49-49.9	1.67
37-37.9	1.31	50-50.9	1.70
38-38.9	1.34	51-51.9	1.73
39-39.9	1.37	52 and above	1.76

Cotton Valley, below 36, $0.75. Rest of Cotton Valley schedule, beginning with 36-36.9 at $1.28, same as Caddo, Homer, etc.

Smackover, below 24	$0.75
do 24 and above	.90
Bellevue	1.25
*Urania, La.	.75
†East El Dorado	1.00

*Posted by Louisiana Oil Refining Corp.

†Posted by Magnolia Petroleum Co.

Smackover prices posted on Feb. 7 by S. O. La., Gulf, Shreveport-El Dorado Pipe Line, Atlantic Oil Producing Co. and The Texas Co.; on Feb. 8 by Magnolia; on Feb. 6, by La. Oil Refg. Corp.

STEPHENS, ARKANSAS

Louisiana Oil Refining Corp.

Below 28	$0.85	30-30.9	$0.91
28-28.9	0.87	31-31.9	0.93
29-29.9	0.89	32 and above	0.95

GULF COASTAL

Posted by Humble Oil & Refining Co.

Effective March 14, 1927

Grades A	$1.20	29-29.9	$1.25
Grades B:		30-30.9	1.27
Below 25	1.15	31-31.9	1.29
25-25.9	1.17	32-32.9	1.31
26-26.9	1.19	33-33.9	1.33
27-27.9	1.21	34-34.9	1.35
28-28.9	1.23	35 and above	1.37

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only.

(*Continued from Page* 126)

week at 7.50 cents with a 1.75-cent tanker rate. Buyers feeling out the market this week, said they were unable to do better than 8 cents, f.o.b. California. Ship owners were offering approximately the same rate as last week.

A flat price of 9.50 cents prevailed for U. S. Motor gasoline in New York harbor early this week. After booking orders for as much goods as they wanted to over May at this price, sellers advanced their quotations for spot business to 9.75 cents. Friday and Saturday, companies willing to sell at 9.50 cents were in the minority. Sellers of California gasoline in a position to take spot orders were asking 10 cents. Sales of occasional cars at this price were reported.

U. S. Motor gasoline at Philadelphia and Baltimore began the week at 9.50 cents flat with a range of 9.50 to 9.75 cents prevailing April 28. At Philadelphia, California gasoline was available at the same prices. Sellers of this grade at Baltimore, however, were quoting 9.75 to 10 cents.

Prices at southern seaboard points were advanced by several major companies. One large terminal operator in the Jacksonville district continued to offer U. S. Motor gasoline at 8.75 cents as against prices 0.25 to 0.50 cent more asked by other companies.

At Savannah, U. S. Motor was quoted at 9 to 9.25 cents. The Charleston market was 9.50 cents flat. Wilmington, N. C., and Norfolk, Va., were quoted at 9.75 cents, although it was indicated in some quarters that 9.50 cents could be done at Norfolk.

New England markets were relatively quiet as far as May gasoline was concerned. The larger jobbers have been reluctant to contract for their requirements over May, according to reports, although one company was said to have purchased approximately 60 cars of U. S. Motor at 11 to 11.25 cents, delivered.

In the Boston district, sellers were asking 10.25 to 10.50 cents, f.o.b. shipping point, for U. S. Motor gasoline for spot shipment and in the Providence area, 10 to 10.50 cents, f.o.b. shipping point. One large seller in the latter market was asking 11 cents, f.o.b. refinery, but reported he had closed no business at this price.

Only routine orders for kerosene were received this week. Prices for water white at New York and Baltimore were unchanged at 7 cents and 7.50 cents, respectively. A flat price of 7.25 cents was quoted for water white at Philadelphia against 7 to 7.25 cents a week ago.

Purchasers, in All Fields (in Effect April 30)

OIL PRICE HANDBOOK published annually)

GULF COASTAL

Prices of The Texas Co.

Effective March 14, 1927

Grades A	$1.20	*Grades B	$1.15
‡Grades B (light crude):			
35-35.9	$1.37	38-38.9	$1.43
36-36.9	1.39	39-39.9	1.45
37-37.9	1.41	40 and above	1.47

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS

Prices of Ohio Oil Co., and Midwest Refining Co.

(Salt Creek prices effective Feb. 21, 1928)

‡Salt Creek below 29	$0.96
" " 29-29.9	1.01
" " 30-30.9	1.06
" " 31-31.9	1.11
" " 32-32.9	1.16
" " 33-33.9	1.19
" " 34-34.9	1.22
" " 35-35.9	1.25
" " 36-36.9	1.28
" " 37 and above	1.31
Elk Basin	1.33
Grass Creek light	1.33
Big Muddy	$1.25
Lance Creek	1.33
Rock Creek	1.25
Mule Creek	1.10
Rex Lake	1.10
‡Osage	1.33
‡Cat Creek, Mont.	1.33
Sunburst, Mont.	1.50
‡Hogback, N. Mex.	1.38
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

CALIFORNIA

Standard Oil Co. of California

Santa Maria and Ventura Posted by Union Oil Co.

Gravity	Signal Hill Seal Beach Huntington Beach	Inglewood Torrance	Whittier La Habra	Newhall, McKittrick, Kern River	Olinda-Brea Canon, Richfield	Athens-Rosecrans Dominguez	Montebello	Coyote Hills	Santa Fe Springs	Midway Sunset Buena Vista & Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria	Ventura
14-14.9	$ .85	$ .85	$ .85	$ .75	$ .85	....	$ .85	$ .85	....	$ .75	$ .75	$ .75	$ .75	$ .85	$ .85
15-15.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
16-16.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
17-17.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
18-18.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
19-19.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
20-20.9	.85	.85	.85	....	.85	....	.85	.85	....	.77	.77	.76	.76	.85	.85
21-21.9	.86	.86	.85	....	.86	....	.85	.86	.85	.79	.79	.77	.77	.85	.85
22-22.9	.87	.87	.85	....	.87	....	.85	.87	.85	.81	.81	.78	.78	.85	.85
23-23.9	.88	.88	....	....	.88	....	.85	.88	.85	.83	.83	.79	.79	.85	.85
24-24.9	.89	.89	....	....	.89	$ .89	.85	.89	.85	.85	.85	.80	.80	.85	.85
25-25.9	.90	.90	....	....	.90	.90	.86	.90	.86	.87	.87	.81	.81	.86	.86
26-26.9	.92	.92	....	....	.92	.92	.87	.91	.87	.89	.89	.83	.82	.87	.87
27-27.9	.94	.94	....	....	.94	.94	.88	.92	.88	.91	.91	.85	.83	.88	.88
28-28.9	.96	.96	....	....	.96	.96	.89	.93	.89	.93	.93	.87	....	.89	.89
29-29.9	.98	....	....	....	.98	.98	.90	.94	.91	.96	.96	.89	....	.91	.91
30-30.9	1.00	....	....	....	1.00	1.00	.91	.95	.93	.99	.99	.91	....	.93	.93
31-31.9	1.03	....	....	....	....	1.03	....	....	.95	1.02	1.02	.93	....	....	.95
32-32.9	1.06	....	....	....	....	1.06	....	....	.97	1.05	1.05	.95	....	....	.97
33-33.9	....	....	....	....	....	1.09	....	....	.99	1.08	1.08	.97	....	....	.99
34-34.9	....	....	....	....	....	1.12	....	....	1.01	....	1.11	.99	....	....	1.01
35-35.9	....	....	....	....	....	1.15	....	....	1.03	....	....	1.01	....	....	1.03
36-36.9	....	....	....	....	....	1.18	....	....	1.06	....	....	....	....	....	1.06
37-37.9	....	....	....	....	....	1.21	....	....	1.09	....	....	....	....	....	1.09
38-38.9	....	....	....	....	....	1.24	....	....	1.12	....	....	....	....	....	1.12
39-39.9	....	....	....	....	....	1.27	....	....	1.15	....	....	....	....	....	1.15
40-40.9	....	....	....	....	....	1.30	....	....	....	....	....	....	....	....	....
41-41.9	....	....	....	....	....	1.33	....	....	....	....	....	....	....	....	....
42-42.9	....	....	....	....	....	1.36	....	....	....	....	....	....	....	....	....

*Union Oil Co. also purchases Long Beach Crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees and in Santa Fe Springs, on gravities ranging from 20 to and including 23.9 degrees.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders as effective the date shown.

Refiners' Supplies

	Apr. 30	Apr. '23
Soda Ash light 58% bags, cwt.	$1.32	$1.32
Silicate of Soda 60 deg. drums, cwt.	$1.65	$1.65
Silicate of Soda 40 deg. tank cars, cwt.	$0.60	$0.60
Silicate of Soda 40 deg. drums, cwt.	$0.70-0.75	$0.70-0.75
Sal Soda wks.	$0.90-1.10	$0.90-1.10
Caustic Soda 76% solid, cwt.	$2.90	$2.90
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton	$11.00	$11.00
Oleum 20%, fuming sulfuric, tank cars, wks	$18.50	$18.50
Sulfur, flowers of, cwt.	$3.10-4.00	$3.10-4.00
Liquid Chlorine, tank cars, wks, lb.	3.50-5.00	3.50-5.00
Litharge, powdered, casks, cwt.	$8.50	$8.50

Compounders' Supplies

Vegetable Oils

Linseed carloads, spot, lb.	9.60-9.80	9.80-9.90
Tanks, spot	8.80-9.00	9.00-9.10
Soya Bean, Tanks, coast, lb.	*9.50	*9.50

Oleic Acid

Distilled, tanks, lb.	8.75	9.00
Distilled, bbls, lb.	9.25	9.50
Saponified, tanks, lb.	9.25	9.25
Saponified, bbls, lb.	9.75	9.75

Lard Oils

Prime Winter Strained, lb.	16.00	16.00
Extra Winter Strained, lb.	13.00	13.00
Extra, lb.	12.50	12.50
Extra No. 1, lb.	12.00	12.00
No. 1, lb.	11.75	11.75
No. 2, lb.	11.25	11.25
Tallow oil, lb.	11.50	11.50

Neatsfoot Oil

Pure, bbls, lb.	15.75	15.75
Extra, bbls, lb.	12.25	12.25
No. 1, bbls, lb.	12.00	12.00
Cold Pressed, lb.	18.50	18.50

Fish Oils

Menhaden Oil		
Light Pressed, gal.	60-61	60-61
Light Pressed, tank cars, N. Y., gal.	52	52
White, gal.	65-66	65-66
Yellow bleached, gal.	63-64	63-64
Whale, extra winter bleached, gal.	82	82

Naval Stores

Steam distilled turpentine, N. Y., gal.	52	54
Steam distilled turpentine, Savannah, gal.	47	50
Gum turpentine, N. Y., gal.	55	58.50
Gum turpentine, f.o.b. cars Savannah, gal.	50.50	54.50
Wood Rosin F, N. Y., bbl.	$7.55	$7.80
Wood Rosin F, Savn'h, bbl.	$6.75	$7.00
Gum Rosin B, N. Y., bbl.	$7.90	$8.00
Gum Rosin B, f.o.b. cars Savannah, bbl.	$7.20	$7.25
Rosin oil, pure, gal.	48	50
Rosin oil, compounded, gal.	39	40

Pine Tar

Kiln burnt, bbl.	*$13.00	*$13.00
Retort, bbl.	$16.00	$16.00

Alcohol

Denatured, Formula 5, in bbls., per gal.	50-54	50-54

*Nominal.

Warmer Weather Puts New Life Into Chicago Gasoline Trade

Staff Special

CHICAGO, April 28

BUYING of gasoline by exporters and return of spring weather to the Standard of Indiana territory Friday and Saturday brought renewed signs of life to gasoline, which had been quiet all week.

Taken as a whole the gasoline market was unsettled as the week ended. Several marketers reported that they were not quoting on U. S. Motor as they had disposed of all their April goods and were uncertain what the first of May would bring in the way of prices.

The largest portion of the Chicago trade was unwilling to quote gasoline over May while others were quoting around 7.25 cents. An exporter was inquiring for 2,500,000 gallons of U. S. Motor gasoline for shipment over the first half of May at a reported price of 7 cents. One refiner reported selling 500,000 gallons of U. S. Motor for the first half of May at 7 cents. This sale presumably was on this inquiry.

Most jobbers were buying on a hand-to-mouth basis, the trade reported and consequently the bulk of orders were for small lots and a considerable number of them were for rush shipment. Reports from outlying territory indicated that jobbers were holding their storage down and that normal May weather, with its increased consumption, would bring them back into the market for good sized orders.

Sales of 58-60 U. S. Motor gasoline were reported mostly at 6.75 to 6.875 cents up to Saturday when the bulk of business was done at 6.875 cents. Two or three sellers were asking 7 cents and one refiner reported sales at 7.125 cents.

The higher gravity gasolines were quiet all week. Of these grades the 60-62, 437 e.p. was in the most demand and prices were higher on it as the week closed. This grade sold at 6.75 to 6.875 cents Monday, Tuesday and Wednesday; at 6.75 to 7 cents Thursday and Friday, and was at 6.875 to 7 cents Saturday. Gasoline of 60-62, 400 e.p. was at 7 to 7.125 cents all week. The 64-66, 375 e.p. grade continued to bring 7.25 to 7.375 cents. Quotations on 64-66 as high as 7.625 cents were heard.

Kerosene was quiet the middle of the week but appeared to be picking up again Friday and Saturday. Reports from most quarters indicated that demand was only fair all week with the bulk of sales on 41-43 w.w. at 5 to 5.125 cents. Several sellers were asking 5.25 cents for this grade.

A Chicago marketer, acting as the agent for several refiners, reported purchasing approximately 190 cars of 41-43 w.w. kerosene at 5 cents and 5.125 cents. This goods was to be used for domestic purposes, he said.

Distillate demand was light all week with prices remaining unchanged. Most sellers were moving their 38-40 straw at 3 to 3.125 cents.

Little change was apparent for gas oils. Demand was steady and most sellers reported that prices were unchanged. One industrial inquiry for 1,000,000 gallons of ordinary dark 32-36 gas oil for delivery over May was expected to be closed April 30. Prevailing prices on this grade were at 6.875 to 7 cents Saturday. Gasoline oil of 32-36 gravity with a zero cold test continued unchanged at 2.75 to 2.875 cents and the 32-36 straw zero grade continued to bring 2.875 to 3 cents.

Most sellers reported a steady demand for fuel oils. Prices were unchanged through April 26 but were approximately 2.50 cents lower April 27 and 28. Most grades were more freely offered than for some time past. Prices of 28-30 fuel were unchanged over the week at $1 to $1.075. The 22-26 and 24-26 grades closed Saturday at $0.825 to $0.875 after being at $0.85 to $0.90 prior to this.

Fuel oil of 18-22 gravity sold April 28 at $0.775 to $0.825 and at $0.80 to $0.875 earlier in the week. Smackover treated fuel quotations and sales were at $0.90 to $0.95 Monday; at $0.875 to $0.95 until Saturday and at $0.875 to $0.925 April 28.

Above normal temperatures are forecast for next week over Standard of Indiana territory. Precipitation is predicted for a few places but will not be of long duration.

PLATT'S

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Pennsylvania Gasoline Price Advances

CLEVELAND, April 28.—Gasoline, naphtha, kerosene and wax prices in Pennsylvania market advanced this week.

Varied reports on the activity of the gasoline market were made by refiners. Some refiners said spot demand was excellent with May business better than that of April and in some quarters much better. Other refiners reported gasolines in good demand but not overly active.

A leading refiner April 26 advanced his price to 9.50 cents for 58-60 U. S. Motor gasoline. Goods was available at 9 to 9.50 cents, with majority of quotations 9.25 and 9.50 cents. Late in the week goods could be purchased under 9 cents from brokers with April gasoline to sell.

Prices rose to 3.75 to 4 cents for 122-124 and 124-126 A.m.p. white crude scale. Light bright stock demand was good; some refiners advanced prices to 29 cents.

Snow storms were reported in Pittsburgh, Oil City and Warren districts Friday night and Saturday morning. One Pittsburgh refiner said a week or 10 days of good weather would stimulate the kerosene and gasoline market.

White Crude Scale Wax Continues Advance

NEW YORK, April 28.—A further tightening in wax markets was apparent at both New York and New Orleans this week. Prices of white crude scale in both markets advanced 0.125 to 0.25 cent. Demand from the consuming trade continued relatively quiet. Most of the trading reported this week was among speculators in New York.

A broker offering 3.60 cents, New York, last week for 200 tons of white crude scale for May delivery reported he succeeded in filling one-fourth of his order at 3.75 cents a pound early this week. The sale of 200 tons of

scale for delivery 50 tons a month from May to September at 3.85 cents a pound, New York, was reported April 27.

Most sellers gave 3.75 to 4 cents as their ideas of the market at the end of the week, although buyers asserted they were unable to better 4 cents, particularly for 124-126.

The fully refined market slowed down a bit as far as prices were concerned but no material change was noted. Goods were no more freely offered, and buyers said 125-127 A.m.p. still was hard to obtain.

White crude scale was quoted at 3.625 to 3.75 cents at New Orleans, and sales of a few small lots at these prices were recorded. A broker bidding 3.375 cents, Group 3,—3.625 cents New Orleans—said he could find no goods available for May delivery.

Semi-refined wax sold at 3.875 to 4 cents and fully refined, 125-127 A.m.p., was quoted 0.125 to 0.25-cent higher.

Lubes for Export Show Upward Tendency

NEW YORK, April 28.—No material increase in buying of lubricating oils for export was noted this week but prices in all markets show more or less of an upward tendency, reflecting better prices for other refined oils.

Dark Pennsylvania bright stock was reported available at a minimum of 33 cents, New York, this week as against 32.50 cents a week ago. Other Pennsylvania cylinder oils also were quoted slightly higher with 600 steam refined 17 cents flat. The 600 flash was 20.50 to 21.50 cents at New York, 0.5-cent higher than a week ago.

New York buyers reported one or two Mid-Continent refiners were still offering 150-160 vis. at 210 oil at 21.50 cents a gallon, f.o.b. Group 3. Other refiners, they said, were up on this oil and were asking 24 cents for future delivery. Mid-Continent neutral oils were slightly higher.

Current reports on the South Texas situation revealed little oil in storage, large export buyers said, and only one company was said to be able to sell for fairly prompt delivery.

Eastern Kentucky Market

ASHLAND, April 30.—Gasoline prices in eastern Kentucky refining district have advanced ¼-cent over the past two weeks. Kerosene prices are unchanged. No fuel nor gas oil is available for spot shipment.

	Apr. 30	Apr. 23	Apr. 16
60-62, 425 e.p. gasoline....	10.00	9.875	9.75

Prices for the past three weeks, f.o.b. eastern Kentucky refinery, are:

64-66, 375 e.p. gasoline....	10.125	10.00	9.875
68-70, 360 e.p. gasoline....	10.25	10.125	10.00
41-43 kerosene.....	7.25	7.25	7.25

California Market Trends Higher; Premiums Paid for Crude

Staff Special

LOS ANGELES, April 28

CRUDE and practically all petroleum product markets trended higher this week, with only two major refineries willing to quote on export gasoline.

Two concerns were refusing to quote less than 7.50 cents on U. S. Motor for export, with others expecting higher prices within the next few weeks.

Crude oil posted prices have not changed but the prevailing premium of 10 cents has increased to 14 cents and up. Premiums are being paid for Long Beach crude and it was reported this week that some offers of 20 cents premium had been made. This situation is due to scarcity of spot crude, rather than to scarcity of crude oil.

Richfield Oil Co. recently closed a contract with Long Beach for that municipality's royalty oil at Long Beach, running 2000 barrels daily, paying a premium of 14 cents. Richfield will begin to run this oil May 1. Small refiners, short of crude for their refinery runs, are willing to pay more than 15 cents for Long Beach crude, one of the best in California on account of its higher gasoline content.

Increased gasoline prices in the East the past two weeks have had real effect on the California situation. Some companies are asking 10 cents up for gasoline to out of state points. Gasoline to points within the state is selling at 8.50 cents to 13.50 cents. Major companies ask 5 cents under the service station price without tax, but a few smaller companies are selling at 8.50 cents and up, meeting competition of Mid-Continent refiners.

Certain Mid-Continent refiners are shipping to points in Arizona at about 6.875 cents plus about 6.25 cents a gallon freight. Freight from Los Angeles to Arizona points is slightly less than 5.50 cents a gallon. A few Independent refiners are asking 5 cents under the service station price without tax for their gasoline.

Fuel oil can still be bought at 70 cents and up in tank cars and about the same quotation prevails on cargo movements. Stocks of heavy crude, including all grades of fuel oils, were drawn upon in California during March at a daily rate of 11,751 barrels, and withdrawals will likely show an increase in April, due to shut in movement.

Natural gasoline is plentiful and some of this product was moving the last week at around 8.50 cents, although several manufacturers are holding at 9.50 cents for spot. Most of the natural gasoline produced in the state is sold under long time contracts, most of which fix 10 cents under service station price without tax as the price. This means 7.50 cents in Los Angeles territory. There will be an important increase in production at Long Beach in April and also in May, due to completion of so many new wells. This large production may soften the market slightly.

Gas oil is scarce. Quotations have not been changed.

Kerosene is dull with no change in prices.

Los Angeles Shipments

LOS ANGELES, April 27.—Twenty-eight tankers left Los Angeles Harbor the week ended April 21 for points outside Pacific coast trade territory, carrying 1,600,927 barrels of petroleum products, or a daily average of 228,704 barrels. The previous week's total was 1,332,778 barrels, or a daily average of 190,397 barrels.

Total movement included 339,569 barrels of crude, 530,157 barrels of fuel, 417,784 barrels of gasoline, 30,896 barrels of gas oil, 181,014 barrels of kerosene, 23,486 barrels of diesel, 14,604 barrels of batching oil and 63,417 barrels of distillate.

Pacific foreign points drew 162,653 barrels of crude, 289,599 barrels of fuel, 45,542 barrels of gasoline, 181,014 barrels of kerosene, 30,896 barrels of gas oil, 23,486 barrels of diesel, 14,604 barrels of batching oil and 63,417 barrels of distillate.

Products going to Atlantic domestic included 176,916 barrels of crude, 79,647 barrels of fuel and 310,242 barrels of gasoline.

Remainder of movement went to Atlantic foreign.

Quotation on Venezuela Crude

NEW YORK, April 28.—Inquiry for a spot cargo of Venezuela crude, 17-22 gravity, drew quotations ranging from $0.92 to $0.93 a barrel this week. Tank steamer rate from Lake Maracaibo region to north of Hatteras continued at around $0.20 a barrel. The inquiry had not been closed up to noon Saturday, April 28.

NEW YORK, April 27.—H. H. Fuller, in charge of gasoline sales in the New York office of Sinclair Refining Co. is convalescing from an operation for appendicitis in Harbor Sanitarium New York. Reports from the Sinclair offices say Mr. Fuller is doing nicely and about two weeks will find him back on the job.

Transactions in Oil Shares on New York Stock Exchange

1927 High	1927 Low	1928 High	1928 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended April 28 Sales	First	High	Low	Last	Change
37⅞	27⅝	38	27½	(sh) 922,075	N.P.	Amerada Corp.	50cQ	Apr. 30, 28	23,400	35⅝	37½	35¼	36¾	+ 1¼
82½	35⅛	82⅛	51¼	(sh) 209,180	N.P.	American Republics Corp.	.....	.....	19,800	73¾	78¼	72⅛	77⅛	+ 2⅜
50¼	35	43	37½	$56,000,000	$ 25	Associated Oil	50cQ	Mar. 31, 28	560	39½	42	39½	42	+ 1¼
131⅜	104	133⅞	95¾	50,000,000	100	Atlantic Refining	$1Q	Mar. 15, 28	99,300	124¼	*133⅞	124½	133	+ 8
119	115½	118¼	116	20,000,000	100	do pfd	$1.75Q	May 1, 28	.....	.....	.....	.....	.....	.....
35⅛	20⅜	26½	22¼	28,725,675	25	Barnsdall Corp. A	.....	Feb. 6, 28	74,900	24⅞	25⅞	24⅛	25⅜	+ 2⅛
32½	20½	25¾	22	799,775	25	do B	.....	Feb. 6, 28	600	24⅜	26¾	24⅜	26¾	+ 4
32⅛	20	31⅛	24	51,524,150	25	California Petroleum	25cQ	Mar. 1, 28	1,500	37⅛	31½	29⅞	31⅛	— ¼
96⅜	65	93¼	71¼	20,785,400	100	General Asphalt	.....	.....	44,300	86½	90⅞	85⅜	90½	+ 3⅝
144⅞	107¼	140¾	114	6,792,200	100	do pfd	$1.25Q	Mar. 1, 28	1,600	130	137	130	135	+ 3½
175¾	60⅛	167	127	25,000,000	100	Houston Oil	.....	.....	12,600	151	153½	147½	151¼	+ ¼
32¾	17⅝	30	21¾	(sh) 500,000	N.P.	Independent Oil & Gas	25cQ	May 7, 28	16,400	28⅛	*30	28	30	+ 1¾
12⅛	7⅝	16⅝	9	$3,280,340	$10	Indian Refining	.....	Dec. 15, 20	17,700	13½	*16⅝	13	16½	+ 3
12	7¼	15	8½	4,550,110	10	do ctfs	.....	.....	8,600	12½	*15	12¼	14½	+ 2⅛
112	99	115½	101	2,296,400	10	do pfd	.....	Dec. 15, 21	100	112¾	*115½	112¾	115½	+ 7
37¾	20½	36⅞	27⅝	(sh) 3,992,122	N.P.	Lago Oil & Transport	75cQ	May 1, 28	9,500	34¾	*36⅞	34	36⅞	+ 3⅝
18⅜	10	19¼	9⅜	(sh) 1,136,500	N.P.	Louisiana Oil Refining	.....	.....	144,900	15⅜	*19¾	15	19¼	+ 4⅛
97	85¼	94½	80	$4,000,000	$100	do pfd	$1.50Q	Feb. 15, 28	350	93	*94½	93	94½	+ 2
22¾	12	25½	12½	(sh) 330,000	N.P.	Maracaibo Oil	.....	.....	27,300	17	*25½	17	23	+ 6
58½	31	44¾	33	(sh) 2,316,692	N.P.	Marland Oil Co.	.....	Mar, 31, 27	77,100	41¾	*43¾	41⅝	43¾	+ 2⅜
320	200	360	255	$45,942,800	$100	Mexican Petroleum	$3Q	Apr. 20, 28	70	300	300	300	300	— 9
.....	.....	.....	.....	12,000,000	100	do pfd	$2Q	Apr. 20, 28	.....	.....	.....	.....	.....	.....
9¼	3	34	4⅝	(sh) 945,939	N.P.	Mexican Seaboard	.....	Nov. 15, 24	67,200	23	*34	22⅞	32½	+10
39⅜	25½	33¼	25⅛	(sh) 1,357,461	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 27	52,200	30½	*33¼	30	32⅞	+ 3⅝
105	97	109	103¼	$6,718,000	$100	do pfd	$1.75Q	Mar. 1, 28	.....	.....	.....	.....	.....	.....
3¾	1⅝	5⅞	2⅜	24,298,850	10	Middle States	.....	July 1, 23	74,400	4⅜	5¼	4¾	5	+ ¼
2¾	1⅜	4	1½	5,501,370	10	do ctfs	.....	.....	9,400	3⅝	3⅝	3¼	3⅜	+ ⅛
1⅞	1	2¼	1¼	(sh) 3,500,000	N.P.	Pacific Oil	.....	.....	187,400	1½	*2¼	1¼	2	+ ⅛
65⅞	40⅛	52⅜	38¼	$48,807,400	$ 50	Pan American P. & T.	.....	Oct. 20, 27	5,100	49	*52⅜	49	52¼	+ 3⅜
66⅜	40¼	53⅜	37¾	121,097,900	50	do B	.....	Oct. 20, 27	124,600	49½	*53¾	48	53	+ 4½
37⅞	16¾	28⅜	18¼	(sh) 400,000	N.P.	Pan American Western B.	.....	Jan. 30, 27	31,000	24⅜	*28⅜	23¾	28	+ 4½
18⅛	8	21⅜	11⅛	(sh) 198,770	N.P.	Panhandle P. & R.	.....	.....	29,300	19¾	*21⅜	17¾	20¼	+ 2⅛
83	54	85¼	70	$2,935,200	$100	do pfd	.....	July 2, 23	800	85	*85¼	84⅞	85	+ 1
60¼	36¼	44	35¼	(sh) 2,406,796	N.P.	Phillips Petroleum	37½cQ	Apr. 2, 28	38,700	42⅜	*44	41⅝	44	+ 2
1½	½	2	½	$29,622,925	$ 25	Pierce Oil Corp.	.....	.....	361,200	1¾	5¼	1⅝	4	+ 2¼
24	13½	30½	16¼	15,000,000	100	do pfd	.....	Feb. 1, 22	5,600	22	*30½	22	28¾	+ 7⅛
5½	2½	6⅝	3½	(sh) 2,500,000	N.P.	Pierce Petroleum	.....	.....	165,700	4⅞	*6⅝	4½	6	+ 1⅜
33⅞	16¾	26⅜	16	$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	9,400	23	*26⅜	22⅝	26⅜	+ 3⅜
50	36⅞	45	41	2,845,350	50	do pfd	.....	May 1, 25	20	44½	44½	44½	44½	+ ½
33½	25	27½	19	75,959,250	25	Pure Oil Co.	12½cQ	Mar. 1, 28	27,000	24½	25½	24⅜	25½	+ 1
115½	111⅜	112⅞	108	13,000,000	100	do 8% pfd	$2Q	Apr. 1, 28	270	112⅛	113	112½	113	+ ⅛
28⅝	25⅜	45⅞	24	$29,224,894	$25	Richfield Oil	25cQ	May 1, 28	122,900	42	*45⅞	41⅝	44⅝	+ 2½
54½	44¼	54⅜	44⅜	(sh) 611,303	13.40	Royal Dutch, N. Y. shares	$1.343	Jan. 28, 28	14,400	47⅜	*54⅜	46⅝	54⅜	+ 7
47⅞	41⅜	46⅛	40⅝	(sh) 77,590	£2	Shell Transport & T	97c	Jan. 23, 28	600	44⅜	*46⅛	44⅜	46⅛	+ 2⅛
31⅜	24⅜	29¼	23¼	(sh) 10,000,000	N.P.	Shell Union Oil	35cQ	Mar. 31, 28	26,100	27⅝	28⅞	27⅛	28⅞	+ 1⅜
26⅜	14¼	24⅜	18¼	$7,208,080	$ 10	Simms Petroleum	.....	Apr. 1, 27	23,300	22¾	24	22⅝	23⅞	+ 1⅛
22⅜	15	30¼	17⅜	(sh) 4,501,915	N.P.	Sinclair Consolidated	.....	May 31, 24	392,900	27⅞	*30¼	26⅜	30	+ 3⅜
104½	97	109½	102½	$16,604,600	$100	do pfd	$2Q	Feb. 15, 28	700	108	*109½	107½	109½	+ 1½
37⅜	24⅛	33	25	27,396,590	25	Skelly Oil Co.	50cQ	Mar. 15, 28	14,000	32	32¾	31⅝	32¾	+ 1¼
60⅜	50⅜	62¼	53	(sh) 13,016,434	N.P.	S. O. California	62½cQ	Mar. 15, 28	53,700	59⅜	62⅞	59	62⅞	+ 3⅞
41⅜	35⅛	47	37⅜	$607,910,525	$ 25	S. O. New Jersey	‡25cQ	Mar. 15, 28	199,900	43⅞	*47	43½	47	+ 3⅛
34⅛	29⅜	33½	28⅜	427,973,275	25	S. O. New York	40cQ	Mar. 15, 28	378,000	33⅜	*33½	33¼	39½	+ 6¼
34⅞	30	44⅜	31½	(sh) 1,206,073	N.P.	Sun Oil	25cQ	Mar. 15, 28	4,700	42	44½	42	44½	+ 1¼
101⅜	99	109½	100	$5,000,000	$100	do pfd	$1.50Q	Mar. 1, 28	100	109½	*109½	108½	108½	— 1½
6½	3⅛	4⅞	2⅛	(sh) 1,121,368	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	38,100	3½	*4⅞	3½	4⅜	+ 1⅜
58	45	62⅜	50	$180,480,550	$ 25	The Texas Corp.	75cQ	Apr. 2, 28	96,000	59½	62½	58⅜	62¼	+ 3⅜
18⅞	12	17	12½	8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	16,100	14½	16⅝	14⅜	16⅝	+ 2⅛
29⅜	19	26⅜	19⅝	(sh) 2,168,410	N.P.	Tide Water Oil Co.	20cQ	Mar. 31, 28	2,700	24½	26	24	26	+ 1
90⅛	85	92½	87	$20,705,200	$100	do 5½% pfd	$1.25Q	Feb. 15, 28	1,800	90¾	*92½	90⅜	92½	+ 1¼
19⅛	15¾	20⅝	14¾	(sh) 4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	59,800	19	20¼	18¾	20¼	+ 1¼
90¾	85	89	82⅛	$72,745,900	$100	do pfd	$1.50Q	Apr. 2, 28	400	88	*89	88	88¾	+ 1¾
10⅛	3¾	10⅛	7¼	(sh) 3,742,029	N.P.	Transcontinental Oil	.....	.....	229,500	8⅝	9⅞	8½	9⅞	+ 1¼
56½	39⅝	57	42¾	$40,791,225	$ 25	Union Oil of California	50cQ	Feb. 10, 28	25,700	54⅛	55⅝	53¼	54¾	+ 1¼
127½	94	125	119⅛	30,844,000	100	Union Tank Car Co.	$1.25Q	Mar. 1, 28	500	122	125	122	124¾	+ 4¾
34½	24½	33¼	26	(sh) 310,956	N.P.	Warner Quinlan	50cQ	Apr. 1, 28	36,500	31	31⅞	30¼	31⅞	+ ⅝
27½	20	24½	20⅛	(sh) 490,000	N.P.	White Eagle Oil & Refining	25cQ	Apr. 20, 28	12,200	22⅞	*24½	22¾	24½	+ 1¾

•New High †New Low ‡Also extras s-Stock Total Sales 3,520,470

Pittsburgh Stock Exchange

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Week Ended April 27 Sales	First	High	Low	Last	Change
9⅞	6⅞	9½	7½	$ 10	Arkansas Nat. Gas	940	8¼	8⅜	8¼	8¾	0
98⅜	80⅞	97⅞	90¼	100	Columbia Gas	.....	.....	.....	.....	.....	.....
107⅞	100	108	108	100	do pfd	.....	.....	.....	.....	.....	.....
15	7½	10	7	10	Devonian Oil	310	8	9½	8	9½	+ 2
....	....	15	9¾	10	Dixie Gas & Util	.....	.....	.....	.....	.....	.....
.....	.....	95	88	100	do pfd	.....	.....	.....	.....	.....	.....
117½	115	116	115	100	Duquesne Light pfd	.....	.....	.....	.....	.....	.....
....	....	85	80½	100	Fayette County Gas	.....	.....	.....	.....	.....	.....
12¼	6	22	12	N.P.	Houston Gulf Gas	20	19	19	19	19	— 1
59¼	37¼	58	48¾	$ 25	Lone Star Gas	1,242	49⅜	49⅜	†48¾	49	— ⅜
3⅞	3	4	3¼	5	Pittsburgh Oil & Gas	.....	.....	.....	.....	.....	.....
8	5½	7¼	6¾	10	Salt Creek Cons.	.....	.....	.....	.....	.....	.....
26½	17	20½	16¾	10	Tidal Osage	.....	.....	.....	.....	.....	.....
43	33	33¼	30½	N.P.	Waverly Oil Wks. A	.....	.....	.....	.....	.....	.....

Pittsburgh Curb Exchange

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Week Ended April 27 Sales	First	High	Low	Last	Change
....	....	2	1¾	....	Arkansas Gas Corp.	2,100	1½	1¾	1½	1¾	0
....	....	9	7½	....	do pfd	17	7½	7½	7½	7½	— 1½
95	88	....	....	25	Gulf Oil	.....	.....	.....	.....	.....	.....
....	....	115	115	....	Houston Gulf Gas pfd.	.....	.....	.....	.....	.....	.....
10¾	5½	7⅜	5⅛	25	Leonard Oil & Dev.	.....	.....	.....	.....	.....	.....
2.70	.30	1.00	.50	10	Omar Oil & Gas	.....	.....	.....	.....	.....	.....
2¼	1¾	....	....	5	Pittsburgh Oil Dev.	.....	.....	.....	.....	.....	.....
31	19	21¼	16¾	5	Plymouth Oil	2,970	20⅝	20⅝	20¼	20½	+ ½
6	5	4½	4½	5	States Oil	10	4½	4½	4½	4½	0
3¼	1¼	4⅜	2¼	1	Texon Oil & Land	1,150	4¼	4¼	4	4	— ¼
23¾	18	18	15	10	Tidal Osage Non-vgt.	.....	.....	.....	.....	.....	.....

•New High †New Low xEx Dividend

Cleveland Stock Market

April 27	Par Value	Bid	Asked	Last Sale
Canfield Oil Co., pfd	100	99	....	100
Fred G. Clark	10	2¾	3½	3
National Refining Co.	25	35¼	35½	35½
do pfd	100	130	135	131
Paragon Refining Co.	25	14¼	14¾	13¾
do pfd	100	125	128	132

Oil Dividends

	Amount	Payable	Stock of Record
Gen. Asphalt pfd. q.	$1.25	June 1	May 16
Nat'l Refg. q.	37½c	May 15	May 1
Pure Oil q.	12½c	June 1	May 10
Sun Oil pfd. q.	$1.50	June 1	May 10
Swan-Finch pfd q.	$1.75	June 1	May 10

Oil Company Earnings

First Quarter	1928	1927
Richfield Oil Co.	$1,390,517	$738,014
Barnsdall Corp.	385,460	955,599
Marland Oil Co.	*1,876,992	228,692
Union Oil Co.	2,500,000	2,600,000
White Eagle O. & R.	306,903	388,007
Pierce Petroleum	*34,265	*129,496

*Loss.

Standard Oil Stocks on New York Curb

1927 High	1927 Low	1928 High	1928 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Sales	Week Ended April 28 First	High	Low	Last	Change
21⅛	17⅞	22⅜	18¼	£ 4,126,460	£ 1	Anglo-American Oil	60⅓c	May 31, 27	2,600	19½	20	19½	20	+ 1
21½	17⅝	20½	18	.....	£ 1	do cts. non-voting	.....	.....	300	18⅜	19	18⅜	19	+ 1
3¾	¾	4⅜	1¼	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	6,000	2½	*4⅜	2¼	4¼	+ ½
6½	2½	9	3¼	$ 10,000,000	$ 50	do pfd	.....	.....	2,200	5½	*9	5½	9	+ 1¼
69	50	56	49	1,000,000	25	Borne Scrymser	‡$1S.A.	Apr. 16, 28	200	52	53	51½	51½	— ½
60	45	76	58	10,000,000	50	Buckeye Pipe Line	$1Q	Mar. 15, 28	200	74	74	73	73	— ⅜
126	76½	161	117¼	3,000,000	25	Chesebrough Mfg.	$1Q	Mar. 30, 28	2,900	137	*161	137	160	+25
22¾	16¼	22½	16	36,057,840	10	Continental Oil	.....	Dec. 15, 27	8,000	18⅞	19¼	18⅜	19	+ ½
137	89	105	88	3,000,000	100	Cumberland Pipe Line	$2Q	Mar. 15, 28	150	103	103¾	103	103⅜	+ 2
68½	47	88	64⅛	5,000,000	100	Eureka Pipe Line	$1Q	May 1, 28	1,750	81	*88	81	86	+10
13½	3½	11	5	16,000,000	100	Galena Signal Oil	.....	June 30, 25	400	9½	10	9½	9½	— ⅜
59¼	23	39	27	4,000,000	100	do new pfd	.....	June 30, 26	20	32½	32½	32½	32½	— 3½
60⅛	35½	48	35	2,000,000	100	do old pfd	.....	June 30, 26	10	46	46	46	46	— 1
68½	54	79	60	73,117,577	25	Humble Oil & Refining	‡30cQ	Apr. 1, 28	68,500	69	*79	68½	79	+10⅛
182	123¾	214½	176½	20,000,000	100	Illinois Pipe Line	$6S.A.	Dec. 15, 27	2,850	202	*214½	202	210	+ 5¼
64¾	37¼	65¼	56¾	(sh) 6,458,267	N.P.	Imperial of Canada	‡25cQ	Mar. 1, 28	3,200	62	64	62	64	+ 2
94½	61	89½	74⅞	$5,000,000	$ 50	Indiana Pipe Line	†$1Q	Feb. 15, 28	7,800	82¾	*89½	82¾	88	+ 3¼
39	28⅛	43	35	(sh) 17,123,444	N.P	International Petroleum	25c	Mar. 15, 28	64,500	39⅜	41⅜	39¼	41	+ 1⅜
24	13¼	32⅛	20½	$6,363,350	12.50	National Transit Co	25cQ	Mar. 15, 28	3,300	29½	30½	29¼	30¼	— ⅝
44⅜	31¼	57½	37½	5,000,000	100	New York Transit	.....	July 15, 26	400	55	*57½	55	57½	0
100	70	125	94	4,000,000	100	Northern Pipe Line	‡$3S.A.	Jan. 1, 28	400	120	121½	120	120	+ 4
67⅛	52	66⅞	58	60,000,000	25	Ohio Oil Co	‡50cQ	Mar. 15, 28	8,100	64⅞	65¾	63	65½	+ 1¼
39	12	84	29	10,000,000	25	Penn Mex. Fuel	.....	May 21, 25	5,600	77	80	75	78½	+ 1½
190	132	223	184	81,000,000	100	Prairie Pipe Line	$2.50Q	Apr. 30, 28	1,000	214	216	214	215½	+ 1¼
55½	45⅝	55½	47⅜	60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	25,600	51¾	54¼	51¾	54¼	+ 2¾
201½	175½	186	167	4,000,000	100	Solar Refining	$5S.A.	Dec. 20, 27	1	186	*186	186	186	+ 6
27¼	15½	33⅛	21	5,000,000	50	Southern Pipe Line	$2	Dec. 1, 27	300	32¾	32⅞	32¼	32¾	— ½
41½	35	53	36¾	20,00,000	25	South Penn Oil	50cQ	Mar. 31, 28	10,400	49⅞	52⅜	49⅜	52¼	+ 2½
83	55½	96	70	3,500,000	100	South West Pa. Pipe Lines	‡$1Q	Apr. 2, 28	300	91¾	94	91¾	94	+ 8
81½	64⅝	80⅞	70⅞	228,415,463	25	S. O. Indiana	‡62½cQ	Mar. 15, 28	40,700	78⅞	80	78⅛	79⅞	+ 1⅝
20⅞	14⅜	27¾	15	8,000,000	25	S. O. Kansas	.....	June 16, 24	3,700	24	24¼	23¼	23⅝	— ⅜
130	111½	136⅛	122¼	17,012,559	25	S. O. Kentucky	$1Q	Mar. 31, 28	7,800	131¾	133	130	131⅜	+ 1⅜
49½	40	44⅞	39⅞	4,559,850	25	S. O. Nebraska	63cQ	Mar. 20, 28	6,600	44⅛	44½	44⅛	44⅛	+ ⅛
87½	72	79	71	14,000,000	25	S. O. Ohio	62½cQ	Apr 2, 28	1,550	75½	77	75½	75½	+ ½
122	117¼	122¼	117	7,000,000	100	do pfd	$1.75Q	Mar. 1, 28	40	122½	122½	122¼	122¼	+ ¼
21	14½	26	16	30,734,000	25	Swan Finch Co	.....	Nov. 1, 19	.....	.....	.....	.....	.....	.....
149⅞	95⅛	153¼	136¾	62.470,800	25	Vacuum Oil	‡50cQ	Mar. 20, 28	2,700	149	152½	147⅞	152	+ 3

•New high †New low xEx dividend ‡Also extras.

New York Curb Bonds

Week Ending April 27

	High	Low	Last	Ch'ge
Beacon Oil 6s '36	107½	104	106¼	+5¼
Cities Serv. 5s '66	98	97¾	97⅞	+ ⅜
Cities Serv. 6s '66	104	103⅜	104	+ ⅜
Cities Serv. G 5½s '42	96¾	96½	96⅝	— ⅛
Cities Serv. GPcs '43	102	101⅞	102	0
Cont. Oil 5¼ '37	97¾	97¼	97⅜	+ ½
Empire O. & R. 5½s '42	95¼	95	95⅛	0
Gulf Oil 5s '37	102⅛	101¼	101⅞	+ ⅝
Gulf Oil 5s '47	102	101½	101¾	— ¼
Indep Oil 6s '39	104	103½	103¾	— ¼
Phillips Pet. 5½s '39	94⅝	94	94¼	0
Richfield Oil 6s '41	131	120	130¼	+7¼
S. O. N. Y. 6½s '33	103	102⅞	103	0
Sun Oil 5½s '39	102	101¾	102	— ¼
Trans. Con't. Oil 7s '30	110	106	108⅞	+3⅞
Valvoline Oil 7s '37	106	106	106	— ⅛
Warner Quinlan 6s '42	105	101½	102⅞	— ⅛
White Eagle 5½s	.....	.....	.....	.....

New York Bonds

Week Ending April 27

	High	Low	Last	Ch'ge
Assoc. Oil gold 6s	103	102½	102½	— ½
Atlantic Refg. deb. 5s	102½	102	102¼	+ ½
Barnsdall Corp. 6s	105	104⅛	104⅞	+ ½
Barnsdall Corp. 8s ex-war.	92½	92	92½	+ ½
Cal. Pet. 5s	101	100½	101	+ ⅜
Cal. Pet. 5½s	103¼	102⅞	102⅞	+ ⅝
General Asphalt 6s	111⅜	111	111¼	+ ⅜
General Petroleum 5s	102⅛	101¼	101⅝	— ⅛
General Petroleum 6s	105¾	105⅝	105¾	0
Humble Oil & Refg. 5½s	102¼	101⅜	102¼	+ ⅛
Humble Oil 5s	101	100¾	100¾	0
Mid-Cont. Pet. 6½s	105½	105½	105½	0
Pan. Amer. P & T 7s	104¾	104¾	104¾	— ¼
Pan Amer. P & T 6s	105	103⅜	105	+ ⅞
Pan Amer. P & T 6s	96¾	95⅜	96½	0
Pierce Oil deb. 8s	104½	104½	104½	—1½
Shell Union 5s	99¼	98½	98⅞	— ⅛
Simms Pet. cvt. 6s	107	106	107	+ ½
Sinclair Con. Oil 7s	103¼	102½	103¼	+ ⅝
Sinclair Con. Oil 6½s	101¾	101	101¼	— ¼
Sinclair Con. Oil 6s D	99½	99	99	— ⅜
Sinclair Con. Crude 5½s	99½	98¾	98¾	— ½
Sinclair Pipeline 5s	97	95¾	95¾	—1¼
Skelly Oil 5½s	95	94½	94½	— ½
S. O. N. Y. 4½s	97¾	97	97¾	0
S. O. N. J. deb. 5s	103½	103¼	103½	— ¼
Superior Oil 7s	103	103	103	— ½
Union Oil of Calif 6s A	111⅝	111¼	111⅝	— ⅜
Union Oil of Calif. 5s C	100⅛	99¾	99⅞	— ⅜
White Eagle 5½s	97½	97	97½	+1¾

Independent Oils on New York Curb

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Sales	Week Ended April 28 First	High	Low	Last	Change
2½	.55	1⅛	.75	$ 5	Amer. Con. Oilfields	45,000	.94	.99	.85	.92	0
7½	2¾	4⅞	3⅛	N.P.	Amer. Maracaibo	3,800	4	4¼	4	4¼	+ 1⅛
2¾	1	4	2¼	$ 10	Argo Oil	500	2⅞	3⅛	2⅞	2⅞	— ⅛
9¾	6¾	9⅞	7⅜	10	Arkansas Nat. Gas	500	7¾	7¾	†7⅜	7⅜	— ⅜
20½	15½	.....	.....	N.P.	Beacon Oil	.....	.....	.....	.....	.....	.....
40	20½	39¾	32¾	N.P.	British American	.....	.....	.....	.....	.....	.....
28¼	15½	23⅞	18½	25c	Carib Syndicate(new)	900	19½	20½	19¼	20½	+ 1½
26	15⅜	.....	.....	.....	do ctfs. of deposit	.....	.....	.....	.....	.....	.....
58¾	40¼	61	54	$ 20	Cities Service	34,000	57¾	*61	57¾	61	+30
95½	87	102¾	94½	100	do pfd	3,500	99⅞	*102¾	99¾	102¾	+ 2¾
8⅞	7⅜	9½	8⅛	10	do pfd. B	900	9½	9½	9½	9½	+ ⅛
29¼	22½	30	28¼	10	do banker's shares	300	28¾	*30	28¾	30	+ 1⅜
3⅜	1⅜	1⅜	1⅛	1	Colombia Syndicate	1,300	1⅛	1⅛	†1⅛	1⅛	0
9¾	6½	7⅝	6½	10	Consolidated Royal	.....	.....	.....	.....	.....	.....
14⅞	9½	16¼	10	N.P.	Creole Syndicate	5,000	15⅝	15¾	15	15⅛	— ⅜
3	.50	1⅜	.76	N.P.	Crown Central	200	1⅛	1¼	1⅛	1⅛	— ⅛
12	4	22⅜	8½	N.P.	Darby Petroleum	23,000	20	*22⅜	19¾	22⅜	+ 3½
11½	4	13½	7⅞	.....	do trust ctfs.	.....	.....	.....	.....	.....	.....
2⅞	.74	1¼	1	N.P.	Derby Oil & Refining	.....	.....	.....	.....	.....	.....
16¾	4	7½	7½	N.P.	do pfd	.....	.....	.....	.....	.....	.....
3¾	1	2	1¼	N.P.	Gibson Oil	7,200	1½	1½	1⅜	1½	0
2	.40	.53	.15	N.P.	Gilliland ctfs.	.....	.....	.....	.....	.....	.....
118	86¼	122	101⅛	$ 25	Gulf Oil Corp.	11,500	116⅜	122	114¾	122	+ 6¼
2⅛	.80	2¼	1½	10	Intercontinent Pet.	9,800	2⅛	2⅛	1⅞	1⅞	— ⅛
2¼	1⅛	1⅞	1¼	N.P.	Kirby Petroleum	.....	.....	.....	.....	.....	.....
10⅞	5⅛	8	5⅛	N.P.	Leonard Oil & Dev.	35,500	7⅜	*8	7⅛	7⅞	+ ⅜
27½	20	26⅜	20	N.P.	Lion Oil & Refg.	4,200	26⅜	26⅝	25⅜	26⅛	— ⅛
59⅜	37	56	49	$ 25	Lone Star Gas	300	48¾	48⅞	48⅛	48⅛	— 1⅜
2⅞	.80	1⅞	.91	1	Magdalena Synd.	81,500	1½	*1⅞	1⅜	1⅞	+ ⅜
21½	20⅞	22⅛	22⅛	N.P.	Manhattan Oil	.....	.....	.....	.....	.....	.....
52	12	45	37¾	N.P.	Margay Oil	400	40½	40½	40½	40½	+ ¼
3	1⅜	40½	40½	$ 10	Mexican-Panuco	.....	.....	.....	.....	.....	.....
12⅛	5	8	4¼	N.P.	Mexico-Ohio Oil	4,900	4¾	5⅜	†4¼	4¼	— ¾
1½	1	1⅛	.90	$ 1	Mountain & Gulf	10,000	94	94	90	90	— 6
29¼	22¾	28⅝	24	10	Mountain Producers	8,700	24⅞	26	24⅞	25¼	+ ¼
5⅞	4⅜	5¾	4¾	5	New Bradford	2,400	5	5¼	5	5¼	+ ⅜
6¼	4	5½	4	10	New England Fuel	1,500	4½	4½	4¼	4¼	+ ⅛
16	9¼	11⅜	8⅛	1	New Mex. & Ariz.	100	10	10	10	10	— ⅞
13⅞	9	15	11½	25	New York Oil	400	14⅞	*15	14⅞	15	— ½
12¾	9½	13	10¾	N.P.	North Cent. Texas	2,000	12¾	*13	12½	13	+ ½
23⅞	21¾	.....	.....	.....	Okla. Nat. Gas ctfs.	.....	.....	.....	.....	.....	.....
9⅜	3¼	6	2⅜	N.P.	Pandem	6,900	3⅞	4	3⅜	3⅞	+ ¼
12⅛	7	15¼	8½	N.P.	Panapec Oil	52,300	14¼	14⅞	13½	14⅜	0
9	7⅜	11⅜	10⅜	$ 25	Paragon Refg.	.....	.....	.....	.....	.....	.....
.37	.25	9	4	N.P.	Peer Oil Corp.	.....	.....	.....	.....	.....	.....
13½	5⅛	7¾	5⅛	$ 10	Pennok Oil	500	7	7	6	6	— 1⅜
.....	.....	4½	3⅛	5	Pittsburgh Oil & Gas	.....	.....	.....	.....	.....	.....
24⅜	7	14	9	25	Red Bank Oil	200	10¾	10⅞	10⅜	10⅞	+ ⅜
15½	3⅛	9½	4⅛	N.P.	Reiter-Foster	14,600	9½	*9½	8¾	8⅞	— ⅝
28⅜	15	31½	22	$ 25	Richfield Oil pfd	2,500	24	24½	24	24	.....
7	4⅛	8⅜	4⅝	N.P.	Ryan Consolidated	23,700	6½	*8⅜	6½	8⅜	+ 1⅜
8	5¼	7¼	6½	$ 10	Salt Creek Cons.	900	6½	6½	6½	6½	— ⅛
35½	27¼	35	28½	10	Salt Creek Prod.	6,000	30⅛	31	30⅛	30½	+ ½
7	1¼	3½	1	5	Savoy Oil	1,300	1½	*3½	1½	3⅜	+ 2⅜
26½	17	22	13	10	Tidal Osage	9,400	21⅝	21⅞	20⅝	21⅜	— ⅝
23¾	15	21¼	13¼	10	do non-voting	10,700	21	*21¼	20¼	20½	— ⅛
92	63½	87	82½	100	Transcontinental pfd.	200	83	85	83	85	+ 2
23¼	7	42½	18	10	Venezuela-Mexico	600	41½	*42½	41½	41½	+ ¼
7⅜	4⅛	6¼	4⅜	5	Venezuelan Petrol.	2,700	5¾	5¾	5⅜	5¾	0
32¾	19½	22⅞	18⅞	N.P.	Wilcox Oil & Gas	12,000	20	21½	20	21½	+ 1½
8	4¾	8¼	5¾	$ 1	Woodley Petroleum	1,400	8	8⅛	8	8	— ¼
6	1⅜	5	2⅛	25	Y Oil & Gas (new)	900	4¼	4⅜	4¼	4⅜	0

•New High †New Low xEx Dividend

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OIL FINANCES

National Petroleum News

Financial Notes

Richfield Oil Co.—Gasoline sales first quarter totaled 50,102,075 gallons, gain of 18,492,947 gallons over sales in first quarter of 1927. Crude oil and natural gasoline production was 2,457,000 barrels, compared with 1,549,000 barrels in first quarter last year. It has just listed $425,728.50 additional stock on New York Stock Exchange, making total listing $44,080,803.50, par value $25 a share.

Atlantic Lobos Oil Co.—This company, in which Atlantic Refining Co. owns a half interest, had a deficit of $209,222 on its 1927 operations, compared with a deficit of $4,117,212 in 1926.

The Texas Corp.—96.21 per cent of California Petroleum Corp. stock has been deposited for exchange for The Texas Corp. stock on a basis of two shares of Calpet for one of Texas.

Penn Mex Fuel Expected To Pay Dividend

PITTSBURGH, April 28.—A dividend is expected to be declared by directors of the Penn Mex Fuel Co. at their May meeting. South Penn Oil Co. owns 51 per cent of the Penn Mex stock.

A year ago Penn Mex settled litigation which had tied up its properties in Alamo district of Mexico for two and a half years. Since then real success has been had in drilling operations. Oil which had been held in storage was released and drilling operations at Paso Real, started last summer, established production of 20,000 to 22,000 barrels a day, which has been steadily maintained. The full extent of the pool has not been ascertained.

A dividend of 50 cents was paid April 21, 1925, but none has been paid since, due to litigation over royalties to be paid to the property owners. This was finally ended by a cash settlement.

E. H. Jones Leaves Associated

LOS ANGELES, April 27.—Elmer H. Jones, who has been with the Associated Supply Co. for the last nine years, recently resigned as sales manager to be Pacific coast representative for Spang, Chalfant & Co., with offices at 912 Van Nuys Bldg., Los Angeles.

Houston Gulf Gas Offers $11,000,000 Bonds

CLEVELAND, April 28.—Houston Gulf Gas Co. is offering $11,000,000 of 15-year first mortgage and collateral 6 per cent gold bonds at 99½ to yield 6.05 per cent. Proceeds of the sale of these bonds, and from $8,000,000 debentures and $1,500,000 preferred stock, are to be used to retire the company's present funded debt, acquire common stocks of the Houston Gas & Fuel Co., and Southern Gas Utilities, the properties of the Houston Gulf Pipe Line Co., and for other corporate purposes.

On completion of this financing, O. R. Seagraves, president, wrote the underwriters, the company will own all of the common stock of the Houston Gas & Fuel Co., more than 93 per cent of the common stock of the Southern Gas Co., more than 83 per cent of the common stock of Southern Gas Utilities, and all of the stock of the Western Gas & Fuel Co.

The bonds will be secured by a mortgage on 299 miles of pipe lines, gas rights in 75,000 acres in eight gas fields, and three compressor stations with 5760 h.p. capacity. Value of this property is given as $16,000,000. Further security will be its stock holdings of the Houston Gas & Fuel Co. and Southern Gas Co. It supplies the principal cities of Gulf Coastal, central and southern Texas with natural gas.

Cities Service Refunds At Lower Rate

CLEVELAND, April 28.—Cities Service Co. has offered $50,000,000 of 5 per cent 30-year debentures at 98 and interest to yield 5.13 per cent. Proceeds from the sale of this issue are to be used, the company has announced, to retire preferred stock and funded debt of subsidiary companies, effecting a saving in dividend and interest charges.

The bonds are redeemable on 30 days' notice at 105 through April 1, 1938, and at varying reductions after that date. A sinking fund of 2½ per cent a year is provided for and bonds may be bought for retirement at 100 or less if obtainable.

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